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Reagan ban puts £8m viewdata contract with Russians in peril

by Nicholas Enticknap

THE US embargo on the billion dollar Soviet gas pipeline deal has put a Rediffusion £8 million viewdata contract in limbo – despite the fact that Prime Minister Margaret Thatcher early last week ordered UK companies to ignore it.

The UK company last autumn won the contract, one of the biggest yet for viewdata systems, from the Soviet Ministry of Gas. The system will be used by the Russians to control the supply of spares for the mammoth gas pipeline project.

The bulk of the hardware for the system was due to be delivered by the end of this year.

But Rediffusion managing director Mike Aldrich said: "There are a lot of unknowns in the situation. For example, there are a lot of American chips in our products: are they affected by the ban or not?"

And Rediffusion's management is now uncertain if the contract can be fulfilled.

Aldrich said: "Another unknown is that our systems are nothing to do with the pipeline itself; all they do is control the spares for the pipeline. So I'm not sure whether they're directly wound up in this business".

The Rediffusion contract, announced last October, is for 46 R-1800 minis running viewdata software, plus 248 Teleputer terminals and 350 VDUs. The bulk of the delivery is scheduled to take place at the end of the year.

The uncertainty arose following President Reagan's decision to ban American trade related to the pipeline in June.

The UK government took six weeks to consider its reaction before adopting the unusual course of refusing to support the Americans, in contrast to its reaction over Afghanistan and Poland.

ALDRICH . . . . A lot of unknowns in Russian viewdata deal.

Vion sues FBI over lost deal

by Howard Karten

THE FBI may have bitten off more than it bargained for in the Vion affair.

Vion Corp was the loser in a recent FBI procurement, in which it was bidding against IBM. Although Vion's bid carried a low dollar amount, the Bureau ruled against it. Now, Vion has retained the prestigious Washington law firm Patton, Boggs and Blow, which is filing a suit to enjoin the Bureau from awarding the contract to IBM.

Vion will charge that the award to IBM was illegal and contrary to procurement regulations.

The FBI was at first quite candid in indicating that Vion lost because it proposed National Advanced Systems hardware containing Hitachi technology, later changing its story to say that Vion had fared poorly when the bids were reviewed.

At the end of last week the Bureau was sticking to its low-profile policy of denying comment. Vion president David Pappert had adopted a similar policy.

Reached at home, Vion attorney Robert Koehler noted: "The government today filed in court an affidavit that admitted that the contracting officer disregarded the technical committee's evaluation and made the determination on his own."

Koehler also said that the FBI's contracting officer dismissed his evaluation team when they continued to recommend the Vion bid even after they had been briefed on the legal and investigative situation vis-a-vis Hitachi and Mitsubishi.

No significant action is expected in the case before August 16 at the earliest.

ICL's CAFS wins industrial approval

by Philip Hunter

ICL's CAFS controller has jumped a big credibility gap with the first sale to a major industrial user.

CAFS has been widely praised even by some of ICL's competitors, but has so far failed to gain marketing momentum partly because it is expensive, costing from £50,000 and partly through modesty on ICL's part.

ICL has now sold 20 CAFS controllers to users mainly in the public sector, including Kingston-upon-Hull telephone exchange and the UK Civil Aviation Authority. It has also been sold to an insurance company and has been exported to South Africa.

The first industrial user is Alcoa Manufacturing, which will link CAFS to an ICL 2946 for online production control at its aluminium smelters in Swansea. CAFS provides database retrieval at disc transfer speed. Alcoa will use it as a memory system for quick access to production data.

"We identified CAFS as the best for information sorting," says Alcoa managing director Alan Aylesbury. "It takes four or five seconds for enquiries that before would have taken up to 24 hours."

"You can ask brief questions and get precise information," Aylesbury adds. This is possible because CAFS employs a pre-processor that expands the text of a brief question into a full one, specifying criteria to pull selected information from the disc.

Ibis faces 'secrets' row again

by Maggie McLening

DISC manufacturer Ibis Systems is now being sued by Burroughs in the US. Ibis settled out of court with Storage Technology Corp earlier this month.

Ibis was forced to pay STC an undisclosed amount in settlement of the case, in which STC alleged that its trade secret had been misappropriated and that 13 of its staff were in breach of contract.

Burroughs alleges that Ibis has also stolen its trade secrets, and is claiming in excess of $20 million and the establishment of a trust in Burroughs' name, making the corporation sole beneficiary of any profits or benefits that Ibis derives from Burroughs technology.

A contributory factor to both of these cases could be that Ibis consists of ex-employees of both Burroughs and STC, as well as Memorex and Xerox, who have not yet filed any claims. In the settlement with STC, Ibis has undertaken not to hire STC or ex-STC employees unless they have been out of STC's employment for at least six months.

The technology in question involves the recording of data in a thin magnetic film on the surface of a rotating disc, using a recording head operating at one millionth of an inch on the disc surface.

Conventional Winchester type read/write heads are used on the Ibis 5000, to give a storage density of 15,000 bits per inch and a data rate of 24 megabits a second per channel.

DoI backs Prestel home users survey

by Donald Kennett

PRESTEL is to be test marketed to 2,500 home teletext users in the West Midlands this autumn to find out what changes would give it the best chance in residential markets.

The plan has evolved from the Commitment to Teletext conference organised in February by the Department of Industry. Significant success was claimed for the promotion strategy developed at a similar conference last year and it was decided to add viewdata to the programme this year.

The first part of the strategy was to concentrate on specific business applications, with residential applications being investigated as a longer process.

Starting with 100 new residential users on October 1, the test should reach 2,500 participants by the end of January. They are to be concentrated in three small areas in West Midlands which have yet to be finally decided upon, but are likely to include Solihull. The number of residential users on Prestel nationally is 2,500 out of a total of 18,000 business and residential users.

Main organisers of the test are the DoI, leading information provider Viewtel Services and market research consultants Marketing Solution. But other information providers are involved in the plans, as well as television manufacturers, retailers, rental companies and British Telecom.

Viewtel, sister company to Birmingham Post & Mail, will co-ordinate the compilation of a new Prestel database with an emphasis on local information and teleshopping services. Viewtel manager John Foxton says Viewtel was the first information provider to make money from its Prestel pages and that at 500,000 accesses a month, its database is accessed more than twice as often as its nearest rival.

British Telecom is considering what changes it can make to the terms for accessing Prestel. Suggestions include a flat £5 a month for access time (as distinct from the information charge or the telephone call) or no charge after 6pm. Other suggestions have included free socket installation and separate billing for ordinary telephone calls and calls to Prestel.

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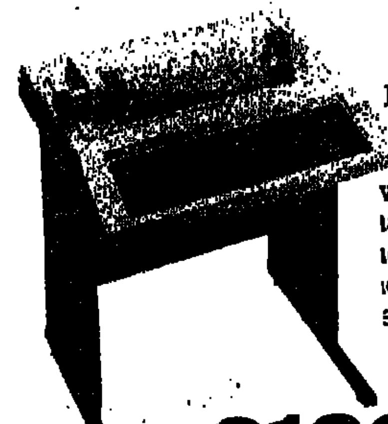
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NEWS BRIEF

Failing AEG awaits £257m lifeline

GERMAN electronics giant AEG-Telefunken, poised on the verge of bankruptcy, this week is waiting for a £257 million lifeline from German banks.

The support is essential to the company as some suppliers are now demanding cash on delivery for orders. AEG is negotiating with foreign banks to guarantee credits for its foreign subsidiaries, most of which are doing considerably better than the parent company.

30 redundant

ABOUT 30 people, mainly sales staff, are being made redundant by Metrotech, subsidiary of the Grand Metropolitan Hotels Group. Metrotech is being merged with the two other computer subsidiaries of the group and the job losses are the result of a decision to stop marketing the Dynabyte range of office systems.

Dutch job losses

THE Netherlands could lose 95,000 jobs by 1990 as a result of new technology, claims a Dutch report. The State-sponsored Social and Economic Council says that 64,000 of these losses will come from commerce, the Civil Service and local government, and that women will be among the worst affected.

RAM race

JAPANESE semiconductor firm Toshiba has upped the stakes again in the great dynamic RAM race. It has announced in Japan that it is about to start serious development work on a one megabit RAM chip, sinking Y20 billion (£45 million) into a special building at its Kawasaki plant exclusively for research and development of the megabit chip.

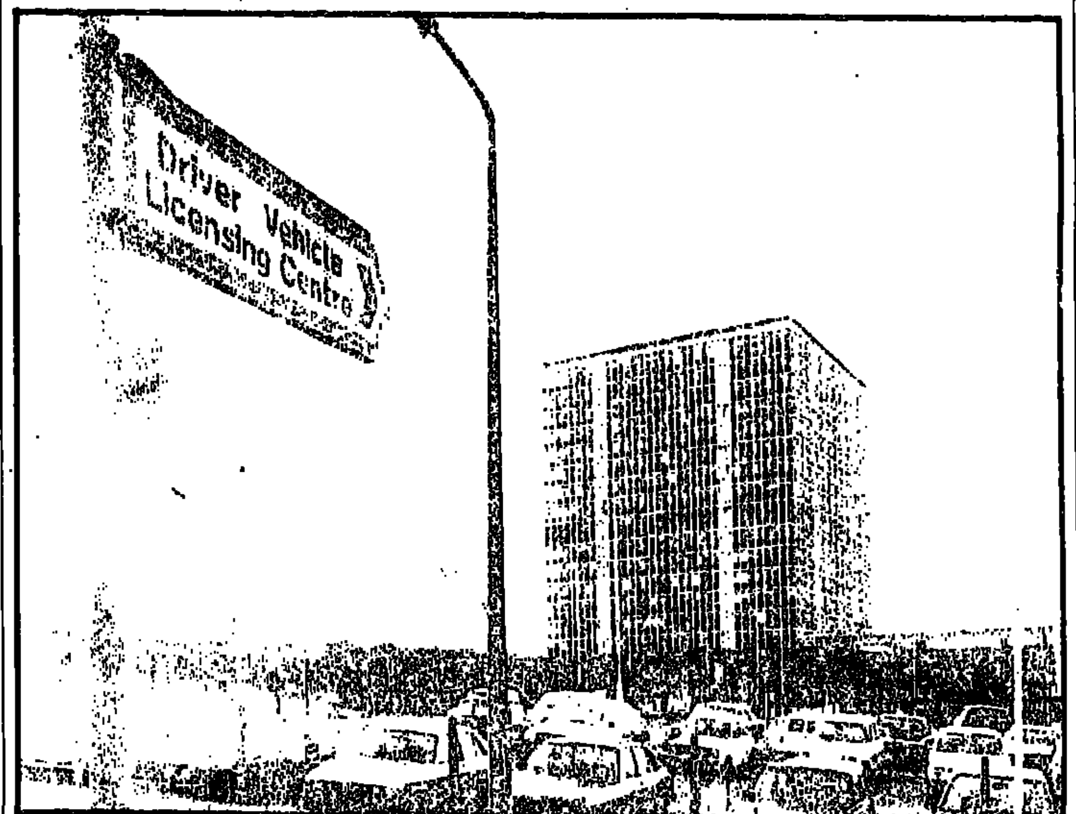
Office onslaught

MITSUBISHI Electric has revamped its approach to the low-cost system market in Japan with the formation of an Office Automation Division. The term "office automation" has different meanings in Europe and Japan, and the new division will embrace small business computers, personal computers, facsimile equipment, point-of-sale systems and word processors. Mitsubishi aims to raise its annual sales of £150 million in these markets, to £450 million by 1985.

End of Delphi

EXXON has closed its Los Angeles-based subsidiary Delphi Systems. Its multi-processor based text and voice message system was once expected to spearhead a clean sweep of the office systems market, a plan formulated by the ill-fated UK company Nexos.

Critical decisions soon on Swansea and PAYE contracts



Will £14 million put this system back on the road?

Govt's buying policy faces £30million test

by Kevan Pearson

THE government is set for a major test this month of its public sector purchasing policy as it awards almost £30 million worth of contracts for the replacement of the troublesome Swansea Driver and Vehicle Licensing Centre computers, and the terminals for the computerisation of PAYE.

Tenders for the DVLC replacement system have just been received in response to the government's invitation to open tender in the official Journal of the European Community at the end of May.

And a decision on tenders for the terminal system of the nationwide PAYE computerisation, worth about £15 million, is expected by the end of the month.

The DVLC tender should include mainframe systems, and peripherals such as optical character recognition equipment to replace the ICL system 4 computers and systems currently installed at the DVLC's Swansea site.

The placing of the invitation in an official EEC publication is regarded as a vital factor in the government's attempts to be seen to comply with the EEC's directive on public sector purchasing. The open tender itself directly contradicts reports at the end of 1981 that the system's replacement should go directly to ICL. The reports claimed that this was at Prime Minister Margaret Thatcher's insistence.

The invitation to tender called for responses to be made within six weeks. It is likely that all the major mainframe manufacturers have tendered for the contract. Both IBM and ICL confirmed that they have tendered.

IBM, in particular, was concerned over the contract, which could be worth up to £14 million. It is also likely that the other US-owned mainframe companies take the same view. Burroughs is especially keen to break ICL's hold on the public sector.

The award of the contract itself will come under the highest scrutiny, following the recent court cases concerning public sector procurement, by IBM and Burroughs. And any deviation from the strict letter of the EEC directive is bound to result in an appeal to the EEC itself.

Just what the replacement system or systems will involve is unknown at the moment, though one of the options currently being proposed is thought to be a distributed system with a series of small mainframes located at each of the Ministry of Transport's 15 regional centres.

Another major public sector purchasing decision is nearing its final stages. A decision on the Inland Revenue's Pay As You Earn (PAYE) computer terminals contract is imminent. The contract is worth about £15 million and Steve Matheson, the project's manager, says a decision is expected within the next week or so.

It is not expected to create any problems with regard to public sector procurement since only British companies are tendering. They are ICL, Plessey and Ferranti. The only overseas supplier, Olivetti, dropped out of the running earlier this year.

'CII-HB needs £200 million to carry on'

by Jack Gee

CII-HONEYWELL BULL, in which the French state now has a controlling interest following the purchase of the bulk of US Honeywell's stake, has reported continuing losses for the first half of this year.

The company had a consolidated turnover for the period of £291 million, a 20.5% increase on the same six months of 1981. But losses for the first half of 1982 totalled £41.6 million compared with £21.3 million for the same period last year.

After taxes CII-Honeywell Bull shows a net loss of £42.5 million.

The company attributes much of this loss to heavy debt servicing costs. These have been aggravated by high interest rates and unfavourable exchange rates for the French franc.

Orders increased by 28.8% and CII-Honeywell Bull sold £141 million worth of equipment and earned £149 million from rentals and servicing.

This disappointing performance adds urgency to the need for a wide-ranging recovery plan for CII-Honeywell Bull. Newly-appointed president Jacques Stern, who comes from the successful SESA firm which created Transpac – France's data packet switching network – reckons that the firm will need very soon £200 million to continue operations.

This sum is in addition to a similar amount which will have to be paid annually to US Honeywell over coming years.

Capital increases of between £20 million and £30 million will be needed to stimulate growth and to conduct research and develop new products.

TAYLOR . . "Sensible to quit."

Logica splits from NEB

by Maggie McLening

SOFTWARE house Logica has finally freed itself from the National Enterprise Board by organising a private institutional placing of its shares. This has raised £5.2 million, most of which will be used to buy the NEB shares in the company.

The NEB, which is part of the British Technology Group, became a shareholder in Logica in 1979 when it helped staff shareholders to buy out a US giant, PRC (Planning Research Corporation) and provided backing for the development of Logica's N2200 word processor. ICL later bought the marketing rights to the N2200 from the now defunct Nexos office technology company, leaving the manufacturing with Logica VTS.

A new holding company, to be known at Logica Holdings, has been created to control the activities of Logica VTS and consulting and software development within the rest of Logica.

Following the re-organisation and private placing, Logica staff have a 54.6% stake in the company

● Turn to page 2

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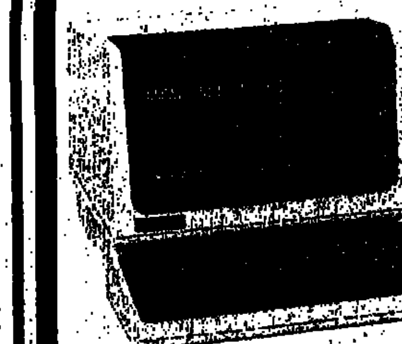
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DEC European sales through $bn barrier....

by Kevan Pearson

DIGITAL Equipment broke the $1 billion European sales barrier for the first time in the year ended July 3, as DEC's worldwide sales and profits rose by over 20%.

Worldwide sales rose 21% to $3.88 billion, with profits up a similar amount to $417 million. In Europe turnover reached over $1 billion as UK sales increased by 22% to reach £173.8 million.

The result confirms DEC's position as the number two computer manufacturer in the world, second only to IBM, which had sales last year of over $26 billion.

However, the current financial year could put last year firmly in the shade following the important products the company launched during the course of 1981-82. Not only did it extend its 32-bit VAX range, both at the top and bottom ends; it also announced a full assault on the personal computer market with two ranges of products.

DEC's two personal computer systems are ideally placed to take advantage of the software that already exists for both its own PDP RSX operating systems and for the proprietary operating systems of the major micro companies, including CP/M.

The two ranges are aimed at different markets, and will extend considerably DEC's influence in the field.

The Professional series is based on the PDP-11/23 processor set, and if DEC only sells half the number of systems that IBM is reported to have sold in the micro market it will make a big impact on the number of RSX programmers in the field.

Ken Olsen, DEC chief, leads in what could be a threatened market.

The Rainbow series is based on a twin-chip system using Zilog's Z80 processor for CP/M, but also offering Intel's 8088. This machine takes DEC into direct competition with IBM, because IBM was the first company to launch a micro based on the 8088 chip.

However, IBM is widely thought to have underestimated the market for its micro, and this is where DEC could make a big impact.

...but minis may be threatened species

by Kevin Cahill

THE most threatened species in the computer industry could be the mini. Falling prices and rising power at micro and mainframe level seem to be the making the mini the jam in an ever thicker sandwich.

But despite these gloomy prospects a report* from Creative Strategies International, the consultancy based in San Jose, California, sees the world market for US manufactured minicomputers rising from a current $7.2 billion, to $12 billion in 1986. This is an annual growth rate of 12%, and CSI expects the market to be led by the 32-bit superminis.

This 58% growth in shipment value is accompanied by almost 100% growth in machine deliveries, from 250,000 in 1981, to 557,000 in 1986.

The report published recently concentrates on US manufacturers only, of which there are over 70, selling something like 500 different models of minicomputers.

CSI gives no figure for deliveries into the world marketplace by other than US companies, but a likely figure is $2.5 billion, or about 25% to 30% of the whole market.

CSI's 1986 projections foretell little change, with the rest of the world's minimakers doing something over $5 billion worth of business, a tilt away from US product of between 5% and 10%, or 2% per annum.

According to CSI, Digital Equipment Corp continues to be the dominant force, worldwide and in the US, in the minicomputer industry. CSI expects DEC to retain a market share in the world minicomputer market of better than 35% through to 1986. In those years, CSI suggests that DEC should be able to maintain an annual growth rate of around 25%.

DEC has consistently hedged on what it expects growth to be, but has always warehoused cash, been ultra-cautious in its forecasts and reorganised rapidly when it foresaw problems.

For the past 18 months DEC executives have consistently sought to curb the wilder expectations of some of the market analysts, particularly those on Wall Street.

In fiscal 1908-81 DEC turnover grew by 35%. The 1981-82 figures showed growth down to 27%, and in the recent quarter they fell to 18%, pretty respectable in the middle of the recession, but not in the true DEC tradition.

Happily perpetuating the myth that the Japanese government funds everything the Japanese computer industry does, CSI sees a significant threat to American domination of the minicomputer from Japan.

Its reasons are as follows:

Heavily funded VLSI projects have spurred Japanese companies to enter the minicomputer and supermini fields;

Japanese government support for software development has been increased considerably;

Japan has pushed past IBM to become the leading supplier in its home market, with 60%, and is looking for foreign markets.

Much more central, however, is the likely impact of microcomputers. The report says that additional technological improvement will result in the microcomputer becoming a sufficient and economical alternative to the minicomputer in a wide variety of applications.

* **The Minicomputer Market**, a Report. Creative Strategies International, San Jose, California. $1,425.

Maestro leads Philips towards £1m bank deal

by Maggie McLening

PHILIPS has got its foot in the door to a £1 million-plus contract to aid Barclays Bank programmers with a boost from German software.

Barclays has installed a Maestro development system, developed by German systems house Softlab, which has 16 screens and is worth about £87,000. If this is successful during the six-month trial period it will be upgraded to cater for the whole 400-strong DP department in a deal worth over £1 million.

The DP department is situated at Knutsford, Cheshire, some 16 miles from the IBM 3033 mainframe on which systems are developed.

"We have installed Maestro primarily to improve testing facilities for our programmers," said Barry Denton, project manager for database and software support at Barclays. "At the moment they are using TSO, but because we are remote from the computer centre there are transmission delays of up to four seconds."

Maestro is claimed to keep response time down to under a second, as well as increasing DP productivity by up to 50%. It is both an office automation system – including word processing facilities which can be used for producing documentation – and a set of programming tools, designed to release mainframe resources from development overheads.

"Maestro will be used for testing spread through a number of current developments," said Denton. "These will include branch accounting, general applications and Barclaycard."

Philips Business Systems has also received two other major orders for Maestro from blue chip companies, both among the top 20 IBM installations in the country, although the names have not yet been disclosed. These companies have 16-screen Maestro systems costing about £90,000 installed on a short-term pilot basis, for evaluation of larger systems.

"It is a major change in working for these companies to transfer from a mainframe to a mini," said Nick Wenman, sales manager for Maestro. "They want to have it on a trial basis to make sure that they get the degree of machine availability they expect."

Piracy is put to legal test in US court

by Nicholas Enticknap

THE legality of software piracy is to be tested for the first time in an American court in December. Microsoft Corp has filed a copyright infringement suit to be heard against an American competitor, Advanced Logic Systems of California.

A number of cases have attempted to protect investment in software by copyrighting or patenting it, but so far no one has successfully taken a competitor to court in the US or even obtained a ruling that such an action is in principle admissible.

Microsoft's case against ALS alleges that the company has copied two programs from Microsoft's Softcard product, which allows Apple II computers to run programs written for use under CP/M. The two programs, called BIOS and BOOT, are used in the ALS Z-Card and as part of an ALS package called the Synergiser, says Microsoft.

Microsoft has gone into great detail in support of its allegations. As part of its declaration to the court, it has filed independent testimony declaring that of the 4352 bytes of code in the two programs, only 149 bytes are different in the ALS product, and of these 126 are altered Microsoft copyright statements.

The company also says that the ALS programs contain the initials of the Microsoft programmer who developed the software, in a location and format similar to that used on Softcard.

Chris Gare, director of European marketing for Microsoft Europe, said, "ALS has demonstrated how blatant copyright infringement can be, and we hope the results of the hearing in December will set a precedent against companies like them who make a living from other companies' investment in expertise and money".

Microsoft has already, in conjunction with other large software companies, taken action against West German company BIASC Computer Systems, a dealer for Microsoft's former European distributor, Vector International.

In this case, which took place three months ago, Vector succeeded in stopping BIASC from duplicating and selling Microsoft programs. BIASC also had to pass details of all customers for these programs to Vector, and to replace the programs with Microsoft's original versions.

Software house goes online

by Kevin Cahill

TABS, the first software house to go to the consumer with ads in the colour supplements, is turning to the telephone to sell its products.

The company has just recruited five telesales girls to spearhead a marketing drive which director Terry Poole hopes will lead the company to turnover of £3 million next year.

Andover-based Tabs, which sells a 20-module range of microsoftware to run on most 8 and 16-bit operating systems, booted itself from turnover of zero to £1.5 million in just over two years.

Poole says that despite the recession, and strong evidence of sales over-estimates by the hardware vendors, Tabs is on target with its sales plans. "We fell slightly below in our first quarter, but have been on course for the past three months."

Meeting sales targets has become doubly important to the company since the recent £150,000 capital injection by merchant bank Hambros.

Hambros, via its new venture capital fund, bought 15% of Tabs stock at a price which valued the company at £1 million.

Poole says that Hambros investment is a concrete endorsement of both the company's marketing strategy and product, which was developed almost entirely by his fellow director David Rogers.

So far the selling strategy has paid off, but Poole admits to some surprises. "I totally underestimated the incompetence of the dealer network," he says, adding that Tabs has now found a solution.

"We make dealers pass a one-week £250 course before we authorise them to sell our product. About one in five fails, but we are still on target for an eventual network of 250, based on the 100 we have taken on so far.

"We had a lot of problems with dealers not being able to distinguish between hardware and software faults.

"Now we tell dealers that it will cost them £99 a day for a fault call which turns out to be in the hardware and not in our software."

Tabs founders Terry Poole and his wife Carol . . . into telesales.

British portable micro out to topple Osborne

by Robert Parry

A BRITISH microcomputer manufacturer, Information and Technology Computer Services (ITCS), is set to take on US portable micro pioneer Osborne Computer. ITCS's Andromeda range is due to see the light of day early next month, and will include a portable machine to sell for under £2,000, complete with CP/M and a suite of business software.

"With the portable Andromeda we are aiming to put Osborne out of business," says managing director David Lewis-Pryce. "They've had it easy for too long. No one is competing with them."

Osborne's UK managing director Mike Healy welcomes a newcomer to the UK portable market. "I'm pleased to see competition. I'm amazed it has taken everyone so long over here," he says. The Osborne machine, unveiled just over a year ago, has already spawned a number of look-alikes in the US.

The Andromeda portable is one of a range of machines ITCS has developed. All will be built in the UK, using British parts where possible, and coming with British software. All machines are based on the Intel 8085 eight-bit microprocessor, and start off at 64K of RAM and one Mbyte of floppy disc storage. Networking systems will feature from the start, says Lewis-Pryce.

He aims to sell about 3,500 systems in the first year – "modest but realistic" he reckons. The company was set up in December last year and has been building up to be able to launch "total systems from the word go," according to Lewis-Pryce. It will also bring out a distributed communications network called Comet, which will receive and display data in videotext format.

HEALY . . . Amased the competition has taken so long.

Fault-tolerant challenge to Tandem and CTL

by Howard Karten

THE world of fault-tolerant computing hotted up last week, with the launch of a fault-tolerant transaction processing system from Synapse Computer Corp, of Milpitas, California. The company's Synapse N+1 system will be competing with hardware from Tandem Computers, Stratus Computer of Massachusetts, and the UK's CTL.

The Synapse N+1 transaction processing system consists of a maximum of 28 shared memory processor modules, each based on a Motorola 68000 chip. Maximum memory for the device is 16 Mbytes, and the maximum number of transaction-oriented devices that can be attached, such as teller terminals or electronic cash registers, is in excess of 4,096.

The system currently supports Pascal and Ansi 74 Cobol. X.25 support is not yet available, but should be soon.

The system is expected to be marketed in the UK and Europe within 12 to 18 months via a subsidiary.

Although Synapse faces a battle as it attempts to gain market share, the company may not be facing a Herculean task. "The market is big enough to support more than one competitor," observed Ellen Spellman, a vice-president of New York brokers Martin Simpson and Co, who follows Tandem.

Logica pulls out of NEB

● From front page

with the remainder divided between Continental European institutional shareholders (18.6%), and UK institutional shareholders who include the Airways Pension Fund and the National Coal Board Pension Fund.

"Our desire is to be very active in developing word processing systems, so it was sensible to rationalise and get out of the NEB," said Len Taylor, managing director of Logica. "The move was also in accordance with the mood of the NEB in its policy of privatisation."

This was confirmed by a spokesman for the NEB: "We are under a duty to privatise and Logica is obviously successful and flourishing in its own right."

Altergo to rescue 80 of its US Insac users

by Maggie McLening

THE Boston subsidiary of Altergo Software is set to rescue 80 of its users, left on a limb when Britton-Lee folded up the operation it had bought on the winding-up of public-funded Insac.

Although Altergo managed to terminate the majority of contracts held by Insac for its Shadow II teleprocessing monitor and Quota II software in September last year, it was unable to withdraw licences for Shadow customers using CPG and the Guts time sharing system, until after Britton-Lee had wound up the Insac operation. This left 80 users without support from June onwards.

"We are recruiting people in the US with CPG experience at the moment, having already seconded someone from London," said Elizabeth Skerrett-Smith, marketing manager for Altergo Software. "At the moment there are 10 people working for Altergo Products Inc, but we hope to double that figure by the end of the year, and then again at the end of next year."

There are over 200 ex-Insac customers with Altergo Products, and these are being taken under API's wing, both through the existing office in Boston, and eventually through other offices yet to be set up.

The newly appointed general manager of API, Joe Piccini, will also be organising a marketing thrust to launch FQS (Friendly Query System), an interactive inquiry utility for running under Shadow II or IBM's CICS, and the Altergo Information Manager (AIM) database and communication system.

PICCINI . . . heading US operation.

"We'll be opening offices in California, Dallas, Chicago and Atlanta to reinforce our marketing and support presence," said Piccini. "One of our first tasks will be to organise an Altergo Products User Group here."

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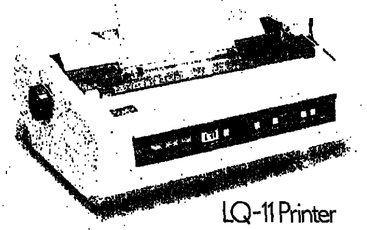

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RAPPORT

Third World moves ahead on videotex . . .

by Jack Gee

A COMMUNITY trial of videotex which French Telecom is to launch in Sao Paolo, Brazil, this month, will be the first organised in a developing country.

The trial, which will involve 1,500 terminals installed in private homes and business premises, will be patterned on the Teletel test which has been under way at Velizy, near Paris, since last summer.

Matra is supplying the initial 1,500 terminals, including 500 of the Minitel type operating at Velizy and also used for France's test programme for an electronic telephone directory.

The other 1,000 terminals are Teletel models. These are basically TV screens with decoders which enable them to communicate with videotex service providers.

Roy Bright, managing director of Intelmatique, French Telecom's subsidiary which promotes exports of telecommunications equipment, says: "The world will be keeping a close eye on Sao Paolo."

Bright, a veteran of British Telecom and Prestel marketing, adds: "This test of Teletel is being conducted in a market which is very different from those of the US and Europe.

"The venture could open up marvellous new export opportunities for Teletel."

Brazilian industry will deliver 3,000 French-designed terminals as the Sao Paolo programme develops.

The venture will include most of the facilities available to terminal users in Velizy. But notably absent will be the "electronic mail box" (and the Telepayment service for which "smart" cards have been issued to 300 residents of the Paris suburb).

Some 40 service providers will be linked to the Sao Paolo test at the outset, and they include a dozen banks. The Brazilian banking industry, which has wider ranging business activities – including insurance – than in the US or Europe, has been active in promoting the videotex experiment.

The Sao Paolo test is being launched in a simplex configuration with a single CII-Honeywell Bull DPS 6 minicomputer as host centre. Within two or three months a full system with three minicomputers will be operating.

The remote host centres are computers already at work in Sao Paolo's banks. Their front ends are being modified to handle the Teletel operation.

Software for the Sao Paolo venture is supplied by Steria, the French firm whose Videopac package is already in use at Velizy.

France's SESA handles Sao Paolo Teletel's data packet switching. SESA set up France's Transpac network and is scooping all the international orders for this technology. Customers include Australia, New Zealand and Luxembourg. A Transpac-type network will be installed by SESA in Brazil next year.

BRIGHT . . . "The world will be keeping a close eye on Sao Paolo."

. . . but US court is delaying AT&T plans

by Howard Karten

AT&T will have to wait seven years before entering the videotex or related fields, if a US Federal judge has his way.

Judge Harold Greene, of the Federal District Court in Washington, said he would approve the negotiated settlement to the AT&T-Department Of Justice anti-trust suit only if that and several other modifications were made to the agreement reached last January.

The judge, who had been hearing the suit almost from its inception up to the settlement, drew his authority to review the settlement from a 1974 law, the Tunney Act, requiring public review and comment on any anti-trust settlement.

Other provisions Judge Greene suggested would provide equal access to the telephone network by several long-distance competitors of AT&T (which rely on computers to provide their services), and would leave revenues from the Yellow Pages directory with local operating companies. The latter provision was also contained in the Wirth Bill that would have reorganised the basic 1934 Telecommunications Act.

The Wirth Bill died in the House of Representatives in late July.

"AT&T shall not engage in electronic publishing over its own transmission facilities," Judge Greene wrote in his decision, and the company cannot engage in any electronic publishing business in which it has a financial or proprietary interest. This provision would be in force for seven years from the time a settlement is officially cleared by all parties.

This would give other organisations time to develop their own videotex or database systems, it is thought.

Many publications in the US have approached electronic publishing with a strong mixture of trepidation and enthusiasm. On the one hand, many newspapers and newspaper chains are participating in videotex experiments.

Nearly all larger publications in the US now use cold type (computer-driven phototypesetting), and so have the inherent capabilities to enter electronic delivery of information without too much additional technology.

In addition, interest in such delivery systems is strong, as shown by the large turn-out of newspaper people at the recent videotex meeting in New York City.

Many newspaper employees appear to be technology-phobic, and newspapers are currently facing shrinking readerships and revenues, both in circulation and advertising.

Newspaper publishers have therefore been reluctant to sink a great deal of money into videotex or electronic publishing when their investments could easily be rendered ineffective should AT&T choose to enter the field and compete with them.

In Reston, Virginia (a suburb of Washington DC) a spokesman for the American Newspapers Publishers Association, which has been fighting to keep AT&T out of electronic publishing, stated: "The public interest will be served if future electronic information publishers are allowed an opportunity to develop as Judge Greene recommends, in an atmosphere in which AT&T may not control both information content and the conduit over which that information must flow."

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Computer to help starving authors earn a crust

by Philip Hunter

THE Public Lending Right scheme to pay authors according to how often their books are borrowed from public libraries is now being set up on a Perkin-Elmer minicomputer. The first 16 libraries to supply sample data for the scheme have been named and testing of the software started this week.

Libraries in the scheme will record the number of times each book is lent per month. This data will be put on to magnetic tape at the nearest appropriate local authority computer site and sent to the Public Lending Right headquarters in Stockton-on-Tees.

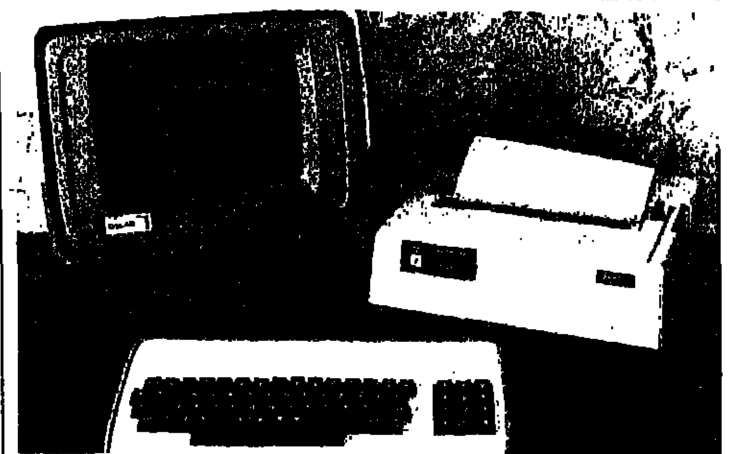
Data is recorded by scanning with a light pen bar codes held inside the cover of the book.

Authors are eligible for the scheme if they are EEC citizens living in the UK. The book itself must be more than 32 pages long if it is prose, or 24 pages if more than half of it is poetry or the dialogue of a play.

So far 300 authors have applied for the scheme out of 113,000 who are eligible. "I expect about half of those eligible to apply," says PLR data processing manager Gil Stokoe.

Since the PLR scheme was set up to support starving authors and not further fatten writers of best sellers, a ceiling of £5,000 has been imposed on annual earnings.

The exact payment in each case will depend not just on the number of books lent, but on other factors such as number of pages in the book.



How will the maintenance be split?

Cheap systems prompt changes in servicing

by Nicholas Enticknap

A NEW era is beginning in computer systems maintenance and service. This has been prompted by the availability of very low-cost systems, which makes traditional on-site on-demand service uneconomic for suppliers.

A feature of this new era will be an unbundling process, whereby different elements of maintenance such as installation, fault prevention, fault diagnosis and repairs will be charged for separately.

These are among the findings of a report* produced with a view to helping European low-cost system vendors develop an appropriate strategy for maintenance. The publisher is market research company Input.

The report shows that, so far, low-cost systems (personal computers, word processors, terminals and the like with a 1982 sales value of less than $13,000) are being maintained by traditional methods.

Two-thirds of users polled depended on on-site visits by either the supplier or a dealer or agent, while another 20% used their own engineers. Only 13% had adopted the practice of returning defective kit to the supplier for repair.

Input reports that users are on the whole pleased with the reliability of their low-cost systems, and they expect the position to get even better as technology develops. All categories of system got a rating of seven or more in a scale ranging from one=poor to 10=superb.

User dissatisfaction with maintenance arrangements is evident, however, in ratings they gave on the same scale. Personal computers scored 4,6 for maintenance service, and only 3.7 for general support.

Word processors did notably better, with ratings of 6.8 and 6.2 respectively, and terminals better still, scoring 7.4 and 7.0.

*Maintaining Low-cost Equipment Profitably. From Input, Airwork House (1st floor), 35 Piccadilly, London W1V 9PB. Tel: 01-439 4442. Price £1,500.

SALES BRIEF

Harris $60m contract for US bomber

THE US Harris Corporation has won a $60 million sub-contract for an electronic system from Rockwell which is building the US Air Force's B-1B Bomber.

The system, called Emux, will control electric power distribution, landing gear operation, control of instruments, fuel systems and weapons systems in the bomber. It uses two small Harris computers to control the plane's subsystems through time sharing techniques over a single pair of wires.

More power

THE Babcock industrial group has won a contract worth several million pounds from the Central Electricity Generating Board for a distributed system in its Heysham power station. Delivery will not be completed until 1986, but the first of the 67 Babcock Bristol UCS computers included in the order will arrive at the end of 1983.

Swedish coups

SWEDISH telecommunications group Ericsson has made two notable coups with its Axe digital switching equipment. First sale has been made to the US for £7.3 million, and it has landed one of its largest contracts, worth £177 million, to supply Malaysia with computerised public telephone exchanges. So far Axe systems have been sold in 40 countries for a total revenue of £1 billion.

Link-Miles lift-off

AN order worth about £600,000 from the US space agency Nasa for a visual system for flight simulators made by the Link-Miles division of Singer UK brings total sales past £10 million since the product was launched in January 1982. Altogether 17 of the Image II visual systems have been sold, including three to the US Air Force, and two to the RAF.

Space venture

CANADIAN telecommunications company Mitel has linked up with space equipment maker Scientific-Atlanta in a space satellite venture that the companies hope will bring $10 million of deliveries and $20 million of orders in the first year. Aim of the venture is to design, manufacture and sell a business communications system for about $100,000 that will make use of satellites and telephone switching systems.

Links for Lola

DATA Logic of London has won a £200,000 contract from Lola (London Online Local Authorities) for terminal systems and communications equipment from Lola, which provides computing services to four London authorities. The system will link with Lola's central IBM mainframe, and be used for community applications such as rent accounting and matching people on council housing lists.

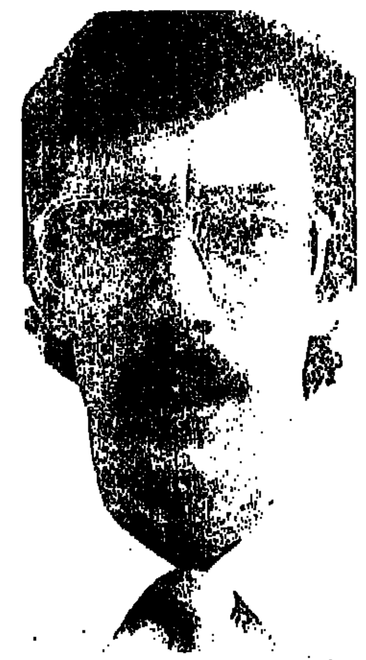
$2.6m tape drives

BALL Computer of Colorado has bought $2.6 million worth of tape drives from San Diego-based Cipher Data Products to incorporate into a disc/tape subsystem for Data General computers. The order includes half-inch streaming tape drives and Ball's 100X compliance arm tape drives.

IBM ousted

ITT Business Systems has won a £200,000 order from National Employers Mutual General Insurance for 100 ITT 3280 VDUs with controllers for its 42 UK offices and an ITT 3805 communications processor for its new head office in Swindon. The 3805 replaces an IBM 3705 and enables the terminals to work in an IBM SNA environment.

SOFTWARE FILE by Maggie McLening



PHILLIPS . . . Put £1 million into software development.

When in Rome–use Datahost

ROME's Sheraton Hotel has ordered a Datahost hotel automation system worth £180,000 from Cara Consulting, the UK software house subsidiary of Aer Lingus. In the past six months Cara has received orders from Munich, Brussels, Copenhagen, Berlin and Amsterdam, with proposals under consideration in Lisbon and Stockholm.

Datahost is an integrated system for large hotels, which offers online front office automation with back-office accounting, and communications interfaces for supplementary systems, such as telephone minitoring equipment, point-of-sale terminals and maid communication devices.

Cara Consulting acquired sole international marketing rights from Philips in February having previously been responsible only for the UK. Philips has been marketing Datahost, which runs on the Philips P7000 minicomputer, in Europe and the US as the IHS system.

Since taking over the system Cara has almost doubled its workforce to 13 and is to move to larger premises in Shepherds Bush.

"We have put over £1 million into the software development of our system," said Colin Phillips, UK manager of Cara Consulting. "Now it can communicate with almost anything, including the DEC Tiger monitoring system, and with five Apples in one hotel."

In the UK, Datahost is already installed at six top hotels, such as the Cunard International, Dorchester, London Tara and, more recently, at the Sheraton Park Hotel.

An order has also been received from the Heathrow Post House, Trust House Forte's flagship of the Post House chain, and Phillips is due to give presentations to hotels in Hong Kong, Singapore and Korea in September.

"I don't think there is anything specially clever in what we do, but people are essentially looking for a high standard of service, particularly in Germany and Scandinavia," said Phillips. "We probably have the most expensive system in the hotel business, but I reckon we're good – and nobody has ever said we were modest!"

ACT Microsoft holds trumps in 16-bit micro software game

SOFTWARE house ACT Microsoft has shown its cards – and the Japanese trumps needed to win the 16-bit micro software game are there.

ACT Microsoft has revealed that its Pulsar portable 16-bit micro software will run on Hitachi and National Panasonic machines, and that negotations are in progress with Mitsubishi and Epson.

It has already announced availability of the software on both the DEC and IBM Personal Computers when they are released in the UK later this year.

Over 2,000 of ACT's own Sirius 1 16-bit machines have been sold in the UK since its release in March and software orders have now doubled to about £30,000 a week.

"American companies are eyeing the software market greedily, and it is up to the British to get in first," said Brian Androlia, sales director of ACT Microsoft.

"Probably the whole of the UK is looking at the 16-bit software market, but waiting until the machines get here. Then it's too late."

Pulsar software includes integrated accounting packages with stock control system, office systems with Wordstar and Mailmerge word processing facilities, and Multiplan financial modelling. All the programs are written in Microsoft Basic to run under the MSDOS operating system.

"Originally all the software was written for CP/M 86, but then we converted it to run under MSDOS and found it was four to six times faster," said Androlia.

Additions to the range include a local networking system to be introduced in January 1983 and graphics software to link with the Supercalc financial modelling package.

ACT Microsoft is to spend £500,000 on advertising to launch the Pulsar software on television and in the Press with a formal official launch at the Dorchester in October.

"We believe we are the first company to sell software on television," said Androlia. "Not many companies are prepared to spend enough on marketing, training and dealer support.

"The key to winning the market is first to offer software independently from hardware so that the user has a choice, then to train dealers and end users in operating it, and finally to offer aggressive discounting to dealers."

Androlia is currently setting up a network of "elite" UK distributors to sell the Pulsar software.

ANDROLIA . . . "It is up to the British to get in first".

Pick on IBM Personal by March

THE Pick operating system will be available on the IBM Personal Computer by March 1983. Universal Computers Limited, distributor of the Ultimate minicomputer range, will market the IBM version in the UK.

Richard Pick, designer of the operating system, has adapted it for IBM machines for Computer Distributors Inc of Seattle. Computer Distributors will be signing a special agreement with IBM to sell a guaranteed number of machines over the next four years.

London-based UCL is to handle UK marketing on behalf of CDI as soon as the agreement between CDI and IBM has been signed.

"We don't expect to sell the software to existing Series 1 users, but there are a lot of people who would like to use the Series 1 as a user friendly terminal and Pick will give them this ability," explained Nick Drescher, managing director of UCL.

IBM has not yet launched its Personal Computer in the UK, and it is currently being unofficially imported by several microcomputer distributors. UCL intends to wait until the official launch before starting to sell the machines because to have IBM's backing will give users more confidence Drescher says.

"When we start selling the Personal Computer we will be importing it ourselves from CDI, and IBM is happy for us to do this," he said.

This will be UCL's first experience of selling IBM hardware, although it has recently changed its role from being solely supplier of the Ultimate family of mini systems to that of supplier of the Pick software on a range of hardware.

MSA to sell integrated mainframe-micro packs

PACKAGE software giant Management Science America is to sell integrated mainframe and microcomputer software. Manipulating extracts of mainframe files on a micro is a service that many bureaux already provide, but few companies offer the software for sale.

MSA will be linking its financial, human resource and manufacturing software for mainframes with the accounting and office productivity micro software from its wholly-owned subsidiary Peachtree Software.

"The idea has been around within MSA for a long time, but we have only just taken over Peachtree," said Stuart Walsh, sales manager. "Acquiring Peachtree has given us a tremendous opportunity to provide these fully integrated packages, including advanced office automation software."

Over the next year, a variety of applications will be released, including customisation of MSA's general ledger financial statements to incluede late changes or footñotes. Peachtree's Peachtext word processing system, and a selection of financial data from the general ledger for budgeting or management analysis by the PeachCalc financial modelling package will be used. Peachtree's newly-announced Business Graphics System will offer colour representation of information held on several of MSA's systems.

WALSH . . . "Minis will gradually be squeezed right out."

"This is a logical progression for us, and follows our belief that minis will gradually be squeezed right out," said Walsh. "We are trying to tie the two biggest markets together, and are obviously looking very much towards the IBM machines."

Prices for the new range of software have not yet been announced, but Walsh said he expected the linking package to be included in the price of the micro and mainframe software for customers buying both.

MDS doubles capacity of Series 21

by Kevan Pearson

MOHAWK Data Sciences (MDS) is doubling the capacity of its Series 21 distributed processing system.

Release 13 of its multi-station systems will allow users to implement up to eight operator stations per system, and increases the memory capacity to 512 Kbytes. It also allows up to nine discrete programs to run concurrently, with two communications programs included. The systems will support IBM 3271 and 3276 SDLC communications protocols.

The company has changed the disc access protocols to give faster access. Release 13 maintains MDS' policy of upwards compatibility and allows existing users, of which there are about 300, to field upgrade their systems to the new specification.

Tom Duddy, MDS' marketing director, describes the new system's 3270 SDLC emulation as a major boost by allowing users to access local or remote IBM installations.

A typical medium range Series 21 system will cost about £26,000.

MICRO NEWS

by Robert Parry

Intel changes gear on 432 development

US semiconductor giant Intel has shuffled responsibilities for its iAPX 432 32-bit microprocessor. Component design, manufacture and marketing have been shifted out of the Special Systems Operation (SSO) into the Microcomputer Group.

But the SSO, which was set up for the multi-million dollar iAPX 432 project, will continue development of board level and systems products using the chip set.

The move is described by Intel as "natural". It puts the component part of the project under its microprocessor operation, which is seen as a more appropriate place for the product.

The progress of the 432 has been sluggish so far, but Intel has not lost faith in it. "It is a product before its time, not an architecture that has fizzled," claims David House, general manager of Intel's microprocessor and development systems division.

House thinks the 432 type of architecture will dominate by 1990, and expects similar object-oriented architectures to be announced by Intel's competitors. The 432 hardware recognises and operates directly on objects — higher level data types than those manipulated by most computers — and supports software transparent expansion of processing and input/output capabilities.

Intel itself is already pushing ahead with refinements of the 432 design. A faster version, with about twice the throughput, is due early next year, and, according to House, a higher level of integration is in development. This will put the present two chips that make up the general data processor on to one.

House sees the 432 architecture as one that will derive a lot of benefit from the increasing number of components crammed on to VLSI chips. "One question is always how to use one million transistors on a chip. With architectures like the 8086 you run out of ideas."

But the 432, because of its memory-based descriptor address system, would particularly benefit from cache memory systems, says House.

HOUSE . . . *The 432 is a product before its time.*

Sinclair names Prism distributor for ZX81

SINCLAIR Research has appointed an independent distributor to look after its ZX81 microcomputer and software products. London-based Prism Microproducts will act as wholesaler to small dealers, leaving Sinclair free to concentrate on marketing the ZX Spectrum.

At the same time, the established retail outlet W. H. Smith is joined by two more high street retail chains, and the price of the ZX81 has been cut from £70 to £50. Greens, a subsidiary of Debenhams, is already selling machines, and will be joined by Boots before the end of the month.

"The market is moving into a maturer phase," says Clive Sinclair. "The personal computer is no longer the preserve of the hobbyist, but rapidly becoming as much a household item as the TV or hi-fi."

The aim of the price cuts and wider distribution net is to ensure a continued large share of this market for the ZX81.

Sinclair's ostensible reason for the £20 price drop is to secure the future for the ZX81 in the light of the more expensive ZX Spectrum launched in April. It echoes a cut in the US price three months ago to $100.

But the £50 UK price also brings the ZX81 into line with threatened competition. Consumer electronics company Binatone is expected to come out with a £50 micro this autumn.

The ZX81 has already sold over 450,000 units worldwide, about 200,000 of these in the UK. Most sales have been through mail order.

Commodore 64 set for small business market

COMMODORE'S renewed assault on the business microcomputer market begins in earnest next month. The Commodore 64, announced at the Hanover Fair in April, will be with UK dealers in quantity towards the end of September, backed up by a suite of standard business applications software packages.

Before Christmas it will be followed by the top-end 720 and 500 Series machines launched at the same time as the Commodore 64, to give Commodore broad coverage of the small business market.

The Commodore 64 slots in at the bottom of the business machine range. It costs £299 (without software or video monitor) and, coming with 64K of RAM and extensive colour and graphics features, is bound to take away some of the market for the current Pet models.

Software packages to come with the machine at launch cover word processing, a financial spreadsheet, information handling and an extended version of Basic. These will be sold under the Commodore name, but have various origins.

Easyscript, the word processing package, is from Precision Software, while the Basic was developed by 16-year-old schoolboy David Simmons.

The Basic vocabulary is extended by adding machine code to allow the micro to interpret more words within Basic.

Hawke adds Compass to range

COMPONENT and peripheral distributor Hawke Electronics has added the line of DEC-compatible peripherals from Compass Peripheral Systems to its product range. Hawke is now the exclusive UK distributor for all Compass products, which include the Orion and Gemini Winchester disc subsystems.

The move confirms Hawke's recent emphasis on the system marketing side of its business. In June it was appointed as an authorised industrial distributor by DEC.

"The close association with both manufacturers will give added strength to our product base," says Hawke managing director David Griffin.

First of the Motorola 68008 chips

MOTOROLA has produced the first sample chips of its 68008, the eight-bit external bus version of the 68000 16-bit microprocessor. It is slightly ahead of plan, says Motorola's UK microprocessor marketing manager Robin Saxby, and bodes well for the virtual memory 68010.

Since the 68010 is running to plan, and both devices involve "minor changes to the 68000 at the silicon level" according to Saxby, 68010 parts should be appearing this year as scheduled.

The coming of the 68008 will give Motorola the eight-bit stepping stone into the 16-bit world that Intel has offered so successfully with its 8088.

COMPANY NEWS

CAP out of the red with £500,000 profit

by Nicholas Enticknap

SOFTWARE house CAP has made a good recovery from the traumas of 1980/1, increasing turnover by just under £1 million to £14.04 million, and returning a profit of over £500,000 in contrast to the loss of £1,274,000 recorded the previous year.

These figures relate to the year ended April 30, 1982. CAP chairman Barney Gibbens commented, "CAP returned to profitability during last autumn and from that time traded profitably in each month of the financial year".

The loss recorded the previous year was mainly attributable to write-offs associated with the company's venture into microcomputer products, particularly its innovative Microcobol language product.

These interests were hived off in March 1981 to a new company, MicroProducts Software Ltd (MPSL), which was formed by a number of CAP employees under the leadership of Alastair Jacks.

CAP also discontinued its involvement in software products under the CPP banner during the same financial year.

The effect of these operations on last year's figures has to be discounted to gain a true picture of CAP's performance since then. According to group accountant Mark Husler, the corrected turnover for 1980/1 was about £12.2 million, which means that the group increased its sales in 1981/2 by 15 per cent.

The corrected profit figure was £275,000, giving a profit increase in 1981/2 of 80 per cent plus, a very satisfactory result attributed by the company to cost reductions and improved productivity.

As to the future, Gibbens noted, "Early indications are that the group is well positioned to resume its growth in revenues and profits."

The company earlier this year announced a major recapitalisation, widening the ownership of the company and strengthening the balance sheet.

GIBBENS . . . *"Well positioned to resume growth."*

UK computer industry booming, says govt

by Nicholas Enticknap

OFFICIAL government statistics just released confirm that the British computer industry is booming again. Sales of computers and peripherals in the UK in the first quarter of 1982 reached nearly £400 million, an increase of 32% over the same period the previous year.

The actual figure was £394.1 million, compared with £299.1 million in the first quarter of 1981 when the industry was in the middle of the recession. The nadir was reached in the third quarter of that year, when sales plunged to £263 million, but the recovery since then has been dramatic.

In the last quarter sales rose by 25% to £329.7 million, and the latest return represents another increase of 20% on that.

These figures place ICL's recent half-year results in some perspective. They showed an increase of only 5.2% for the same two quarters over the corresponding period of the previous year. ICL has therefore under-performed considerably compared to the UK industry as a whole.

This highlights the effects of the two factors identified by ICL chairman Sir Christophor Laidlaw when presenting the results. ICL has deliberately slowed its growth in order to ensure a return to profitability, and has in addition suffered from poorer than expected performance in its principal export markets.

The government statistics also report employment levels in the UK industry. The total workforce in March 1982 was 40,400, the lowest recorded since statistics began to be kept in present form.

Clash of names forces FTL to change future plans

by Philip Hunter

THE computer industry's lack of imagination in inventing names has caused its fair share of confusion for users. But the Registrar of Companies decided that enough was enough when it discovered there was a Future Technology Ltd (FTL), and a Future Technology Systems Ltd (FTSL).

FTL was ordered to change its name because FTSL had registered first.

FTSL is based near Glasgow and makes a distributed system called Series 88. FTL is based in Litchfield, Staffordshire and is the UK distributor for the US-made Micro Five business computers.

FTL managing director Nick Flowerdew blames the Registrar of Companies for failing to point out the possible confusion when the name was registered. "They gave no indication whatsoever that there would be any problem with that name," he says.

FTL has submitted a number of new names for possible registration.

The names of packages have also been known to clash, and last year Compact Accounting was ordered to change the name of its system package from Genasys. The reason was that the computer industry already had more than its fair share of companies with names sounding like Genesis, although all had different spellings.

There was Genasys Computer Services of Cardiff, which changed its name voluntarily without the intervention of the Registrar of Companies to Target Computer Services.

Then there is Genesis Computer Systems of Manchester and another company called Genesys in Loughborough.

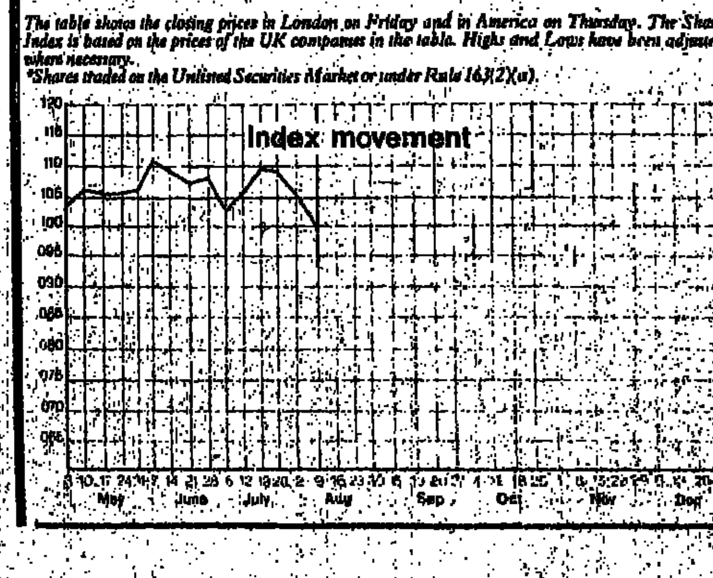
CW SHARES TABLE

Date 13/8/82 Index 98.64 Change -7.06

Pence 1982 High	Pence 1982 Low	London Stock Exchange Stock	Pence Price	Pence C'nge	$ 1982 High	$ 1982 Low	US Stock	$ Price	$ C'nge
203	161	ACT (App Com) (25p)	195	-6	28¼	18	Amdahl	19¾	-2¼
180	150	BOC Int (25p)	165	-10	20¾	11¼	Apple Inc	13⅛	+⅛
30	18	B. Bov Kent (25p)	30	-	28	21	Auto Data Pro	21	-2¾
127	101	Chubb (20p)	114	-	37¼	30¼	Burroughs	30⅛	-¼
94	48	Cole Group (25p)	84	-4	13¼	7⅞	Comp Auto	8	-
303	233	C.A.S.E. (20p)	260	-10	15	11¼	Comp Sciences	11⅞	-1
730	445	De La Rue (25p)	475	-10	15½	12⅛	Comshare	12½	-
360	238	Extel (25p)	325	-15	38½	22	Control Data	22	-1⅛
426	312½	Ferranti (50p)	387	-12	38¼	21½	Cray Research	21½	-¾
1087½	787	GEC (25p)	1018½	-44	63¼	21⅛	Data General	21¼	-3½
64	33	ICL (25p)	54	-5	49½	11⅞	Datapoint	11⅞	-¾
47	40	Kalamazoo (10p)	40	-3	24½	16⅛	Dataproducts	16⅛	-⅜
310	223	Kode Int (25p)	265	-10	87½	62¼	Digital Equip	62¼	-1⅛
305	215	Memec (10p)	305	+12	29	18⅛	Elec Data Sys	26¼	-1⅛
170	110	Muirhead (25p)	164	-4	6½	3½	Gen Automation	3½	-
264	218	N'market (1981) ($.05)	239	-6	38¾	22	Harris	24½	-1
820	670	Norsk Data	660	-30	46¼	38⅛	Hewlett-Packard	39	-2¼
380	266	Office & Elect (25p)	380	-	78	61½	Honeywell	61½	-5
540	445	Philips Lamp (fl10)	492	-13	33¼	20⅝	Intel	27½	-4⅛
528	348	Plessey (50p)	513	-10	60¾	57	IBM	62¼	-3¼
97	20	Quest Auto (10p)	20	-10	56	38¼	Litton Ind	38¼	-3¼
468	353	Racal Elect (25p)	468	-12	13¼	8⅛	MDS (Mohawk D)	11½	-¼
250	171	Rediffusion (25p)	216	-5	24	18	MSA (Mgmnt Sci)	21¼	-
468	306	Thorn-EMI (25p)	405	-18	18⅛	7⅞	Mngmnt Assist	7⅞	-1½
90	74	UC&T (50p)	85	-2	9¾	6⅛	Modular	7	-⅛
					69	60¾	Motorola	60⅛	-4⅛
					24½	14⅛	National Semi	14⅛	-2½
		OTHER MARKETS*			55¼	40½	NCR	50	-2
					26¾	17¼	Perkin-Elmer	17¼	-½
90	80	Bus Comp (10p)	80	-	22¾	16¼	Prime	16¾	-1
557	415	Comp Serv (£1)	451½	-	40	29¼	Raytheon	35⅛	-2½
200	78	Consult (C&F) (10p)	188	-2	26¼	14	Signal	14	-¾
185	182	Int'europe Tech	182	-4	34	21	Sperry Corp	21¼	-⅞
262	245	Jo Tech (25p)	260	-	34½	16½	Storage Tech	16½	-⅛
80	48	Knight (5p)	49	-3	29½	16¼	Tandem	16¼	-
160	112	Miles 33 (10p)	160	+12	39	23¼	Tandy	23¼	-2
170	85	NMW (£1)	85	-12	93¾	70¾	Texas Inst	81	-3
104	43	Rolfe & Nolan (10p)	100	-4	27½	12½	Tymshare	15½	-½
120	78	ScanData (10p)	115	-	35¼	25½	Wang Lab B	25½	-1½
255	160	Star Comp (10p)	255	+15	10½	7½	Wyly	8⅛	-1½
106	88	Trident Comp (10p)	88	-					
112	78	Zygal Dyn (5p)	103	-3					

The table shows the closing prices in London on Friday and in America on Thursday. The Share Index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.

**Shares traded on the Unlisted Securities Market or under Rule 163(2)(a).*



Since 1971 Digital's PDP-11s have been synonymous with 16-bit computing.

And for the last four years the VAX 11/780 has been regarded by the computer industry worldwide as the yard-stick in 32-bit computing.

Now Digital have created a series of three personal computers for professional applications. Powerful, yet easy to use. Designed without compromise.

Consider a few facts.

The Rainbow 100 is the entry level model. It runs both 8-bit and 16-bit CP/M* programs. Automatically. And all for the price of an ordinary 8-bit personal computer.

Options include "bit-mapped" colour graphics and "executive" word processing.

The DECmate II is tailored for professional word processing. It handles list processing, office management software and conventional CP/M programs.

The Professional 300 series, based on the PDP-11 is capable of managing many tasks simultaneously. And it can self-diagnose with its P/OS operating system.

It can also support a 5M byte mini Winchester and process text, blueprints and pictures.

Each system can emulate the VT100 terminal. And each system is covered by support services that are normally only standard on large systems. There's even a free one year on-site warranty.

To find out just how different personal computing can be, write for further information.

And decide for yourself if history will repeat itself.

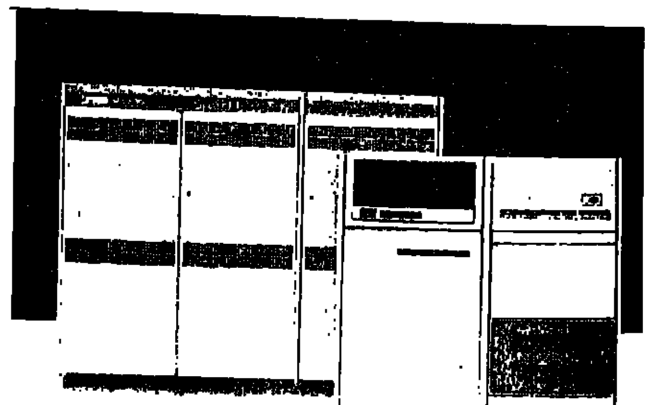
To: Teresa Gubbin, Digital Equipment Co. Ltd., P.O. Box 110, Digital Park, Imperial Way, Reading RG2 0TR.
I'd like to know more about Digital Personal Computers. [CW5/8]

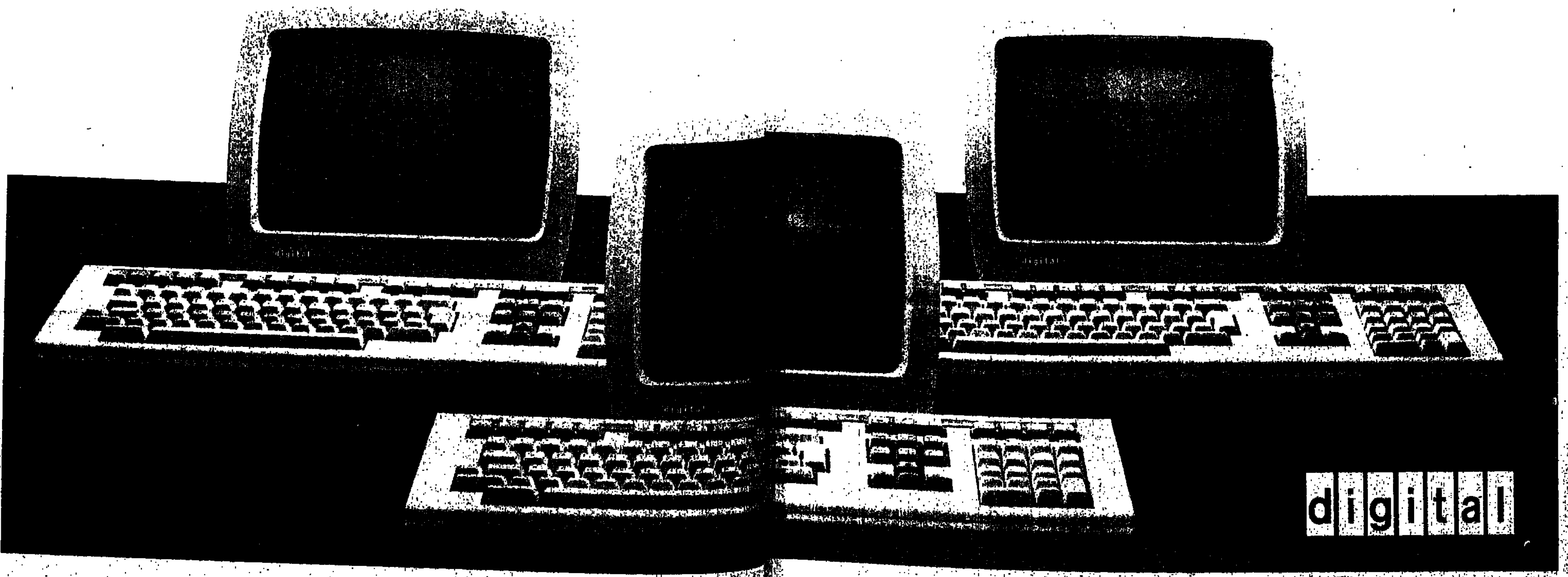
Name
Company
Address

Position
Telephone

*CP/M is a registered trademark of Digital Research Inc.

Is Digital about to set the standard in personal computers too?





digital

SYSTEMS THOUGHTS

The age of heroism is over – it's time to learn how to design systems

DURING the Sixties I was part of a team implementing a production control system. We intended to provide a production schedule for the factory on Monday morning, and in order to do this a 40-hour run over the weekend was required.

As the data for this run was not available until Friday evening, a failure at the end of the run could lead to the production schedule not being available until Tuesday. Not surprisingly, we built checkpoints into our run so that the results of a failure were less drastic.

That system was implemented on 2314s, and the run time was cut dramatically when 3330s became available.

One user pointed out recently that in his installation (a large bank in Europe) they no longer used checkpoints, because the combination of shorter run times and lower failure rates offered by modern systems had made them unnecessary. While I accept that, and recognise that checkpoints are only an option to be used when it suits us, the way they have been used in the past is typical of the approach taken to most systems design decisions in data processing.

Where the designer of a bridge – or even a house extension – will carry out calculations to ensure the safety of the design we in data processing are likely to trust our "judgment". Often this is reasonable, but it is hardly professional.

To take the case of checkpoints a little further: there are two reasons why we may wish to take checkpoints.

The first is if we can reduce the overall average run time by their use; the second is if the run has to be completed by some final time even if failures occur.

The first case has been investigated by a number of people, particularly Chandy ("A survey of analytic models of rollback and recovery strategies", Computer, May 1975, 40-47) and more recently Gelenbe ("On the optimum checkpoint interval", Journal ACM, 1979, April 2, 59-270).

For tape-only systems it often turns out that the incorporation of checkpoints into a run will reduce the *average* run time. Disc systems, on the other hand, will only justify checkpoints if the run is very long or the probability of failure is high.

The second case is much more common, but has not been investigated in the same detail. I shall be presenting a paper on checkpoints at the Australian Computer Conference in Hobart later this month, in which both cases are analysed mathematically and – far more important for the busy systems analyst – curves relating to run time, recovery time, probability of failure and the optimum number of checkpoints required for the run are given.

The main point to be made about checkpoints is that there is no need for guesswork. Information on the optimum number and placement of checkpoints has been available for a good while – at least for the first case I discussed – and yet many data processing people are quite happy to make their decisions without confirming them in any methodical way. The same seems to be true of other areas that can be analysed in detail, such as file design, database design and even the layout and availability of secondary storage hardware.

This attitude may well have stemmed from the many ways in which a successful program can be written. That led to the belief that "If it works it's OK", which is only gradually being replaced by a more orderly, structured approach to programming.

However, much of systems design is quantifiable and it seems to me that we should be aiming for an attitude to systems analysis that encourages people to learn the subject before they practise it.

On-the-job training was understandable some years ago, but the

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"heroic" age in data processing is virtually at an end and it is both easier and safer to learn how to design systems, rather than teach yourself.

Although new equipment and software are constantly appearing, we have found that students who *have* learnt are at an advantage in industry at once. They may be short of experience, but they know how and where to find the answers to many questions that worry their "elders and betters" in the industry. I believe that, as the first students who met micros at school and followed that by a full education in data processing move into the industry, the only analysts and programmers who will not feel threatened are those who are genuine professionals.

They will have the knowledge and experience to welcome the newcomers.

Owen Hanson

FOCUS

Head-hunting – a fact of DP life

THERE is a widely-held view that American DP management have it made. Not only are they blessed with lavish budgets and working conditions, but the job rewards are of an enviable level.

They are also, it seems, a most vulnerable species constantly in need of care and protection. Certainly there is no shortage of advisory services competing to offer an understanding hand and expensive doses of comfort.

Management counsellor and career therapist Donald J. Berardo suggests that DPMs should beware of head-hunters. They will, he declares, use any trick to gain entry, and eventually one or two will succeed.

Apparently there are no depths to which the head-hunters will not stoop, even to the extent of asking the DP centre secretary for a list of personnel involved. American DP teams are warned to be on their guard and to man the installation job barricades.

In the UK, however, there is a widely-held belief that a spot of head-hunting at least once a year is good for all involved. It certainly helps to make the individual feel wanted and adds bargaining muscle in pay negotiations with his company.

Similarly, the employer is made aware that he has on board a valuable commodity whose talents must be recognised.

Not only is head-hunting a fact of DP life in the UK – it is the lifeblood of many newly-emerging or expanding companies. The laws of supply and demand have seldom existed in the computer industry, the demand element being most often in the several-paces-ahead mode. Whether it is an aggressive disc system sales manager, senior telecom specialist, or talented database technician who is being recruited, a head-hunter approach can often be the only practical method of getting the right man.

Breeding grounds for this market usually involve such leading organisations as IBM, Texas Instruments, NCC and British Telecom, while the hunters represent the keen PCM and smaller system houses.

UK recruitment consultant John Merrifield, of Michael Drayton Ltd, reports that there is currently a heavy demand for microsoftware and training specialists and individuals with proven records in videotext and datacom technologies. No doubt head-hunting Exocet missiles are already being primed.

For those on the receiving end of a head-hunting operation, an interesting time can be promised. Approach routines are fairly constant, with telephone messages left with the individual – or his secretary – for a return call. The more efficient hunter makes initial contact at the target's home number. Provided the individual shows some degree of interest, the next step will be the arrival of the job specification. Selection organisations being notably reluctant to name their clients, it is up to the individual to make a positive identification or inspired guess.

Failure to do so at this stage could result in disqualification on the grounds that he is not sufficiently informed on the market place.

Identification clues should not present a major challenge. American companies, for example, tend to mention revenues while the UK prefers the term turnover. An international company centred in London dealing in advanced technologies could be translated as a Californian micro-chip manufacturer setting up trading operations in Europe.

As a general rule, the more important the position, the fewer names on the selection files. Although head-hunters like to present a short list to their clients, a list of one individual would be acceptable if all are agreed that the individual was the right person for the job.

Just about the only part of the head-hunting exercise not wholly enamoured is the employee's company. But until companies follow the example of football clubs and demand hefty transfer fees, or the government imposes special taxes on the individuals concerned, those on the receiving end of head-hunting offers should count their blessings – and their new pay cheques.

Alan Simpson

DOWNTIME

It was just one of those days

SO complicated is the running of a computer installation that the odd little slip-up is only to be expected. When you are a remote user to a major data centre, a total lack of computing power when you most need it is just part of life's rich tapestry.

IBM users in particular are blessed/cursed with a plethora of packages which require to be loaded/parameterised/updated with the greatest care if cock-ups are to be avoided.

You will, of course, be aware that the risks of failure are greatly multiplied when the work you are attempting is a demonstration. Add the further complication of having the computer Press present, and the chance of a total collapse is almost guaranteed.

Take, for example, the following true story:

Company A is putting on a demonstration for computer publication B, using company C's large IBM installation. Company C has almost limitless IBM experience in every field, so company A is reasonably sure that all will be well for the Press demo.

"And this is how it works. . . . Oh, it's not supposed to do that!" Several attempts are made, but to no avail – the required screen format refuses to be located.

Enter a complication in the form of systems engineer Murphy. "Er, I'm just changing my terminal over to the VS service. Shouldn't affect you. Bye."

Murphy vanishes. Short pause. Screen goes blank. Screen lights up: "Welcome to the VS service."

Demonstrator: "Aaaarggh!"

Murphy returns. "Everything OK?"

"Not exactly."

"Oh. Hang on a bit, I'll get someone else."

"Look, we're trying to do a demo here, get this terminal running again!"

"No problem, just hang on." Murphy vanishes again.

Phone rings. It is the distant computer centre. An embarrassed systems programmer apologises for running up a new version of the comms package without the requisite screen format.

Murphy returns with a friend. Friend plugs terminal into another socket. As if by magic, the required service identity appears on the screen.

Demonstrator: "Hooray!"

Exit Murphy and friend.

Demonstrator: "Right. *This* is how it works."

Screen flickers and goes out.

Demonstrator: "£*/££&!!"

Journalist calmly replaces fuse in terminal. Screen relights. Demonstrator tries again. IT WORKS!

Company C (the one with almost limitless IBM experience) can now be identified as . . . IBM, the demonstration terminal resides at IBM Croydon, the large mainframes lives at IBM's Warwick data centre, and all the failures in the above story are 100% down to IBM.

Now, doesn't that make you feel good?

Take it away, Cobber

BLACK armbands all round for our cousins in the Antipodes. Australia's only ICL 2970 is destined for the car crusher a mere six years after its installation. ICL Australia has taken away the unwanted number cruncher, but admits that it has no idea what to do with the orange (or should that be lemon) box.

"We did the right thing by our clients and took it off their hands," said an ICL spokesman.

The 2970 occupied an entire floor, and has been replaced by a DEC VAX 11/780 which only takes up one corner.

Not only that, you don't have to run VME/B on it either.

So smooth

EVER heard of the computer industry's 'lawnmower connection? Last year I explained how Mitel, that major manufacturer of private automatic branch exchanges (PABX), came by its name. It stood for MIke and TErry's Lawnmowers.

Now there is a second link in the chain. Flymo of Darlington is trying out a computerised data collection system for lawnmower research. Voltage, current, power factor and torque are the parameters that feed the model.

Let's hope that the grass will be greener for all that.

Which twenty years?

MANY are the wild and wonderful claims emanating from the mouths and typewriters of that great American institution, the advertising agency. Computers, due to their mysterious occult powers, are an easy number for professional wielders of hyperbole.

Deletion of the last five letters of the final word in the previous paragraph results in a pretty fair description of an advertisement appearing in the quality dailies recently. Sperry Univac was pushing its Mapper package as "the most important advance in computers in 20 years".

Believe it if you like, but would you buy a used car (or software package) from a man who claims that the fact that "Mapper is so powerful that it can enable a number of people to talk directly to a computer SIMULTANEOUSLY" (my capitals), puts it in the "most important event in 20 years" category?

On the other hand, they don't actually say *which* 20 years. Perhaps they mean 1940-1960.

Saved again!

IT is a well-known fact that we here at Computer Weekly are the sole repository of all knowledge and wisdom on the subject of computers. But even our relational database (the editor's Uncle Fred) was stumped by a local authority's claim that one of the three companies tendering for its new computer was called Multivac.

Luckily, we were rescued from our ignorance by the appearance of the science fiction editor of Computer Twaddle, Damian Phasor-Warppe-Engynne.

"Hey man, that's the dude from Isaac Asimov – the computer as big as a city block, runs on valves and things," he stated in his usual eloquent manner.

No wonder they didn't get the contract, whoever they were.

Chad

10 YEARS AGO

From Computer Weekly of August 24, 1972 . . .

THE computerised block share dealing system, known as Aeriel, to be set up by the City's leading merchant banks, would be based on a duplexed Digital Equipment DPD-11/40 configuration worth almost £100,000 . . . . First stage of a powerful new General Electric time sharing service, was due to become operational in the US in September . . . . Without computers, the introduction of VAT would not have been possible, according to Richard Harrington, director of the Business Equipment Trade Association.

HUMAN TOUCH

Four out of five

THE advantage of a rule of thumb is that there is no obligation to prove it correct. The 80/20 rule comes into this category.

It is quite useful, and practical experience shows it to be almost universally true. The rule states that 80 per cent of the activity is covered by 20 per cent of the items.

There is no definition of "activity" or "items" so you can apply the rule to almost anything, especially if you find that it fits.

For instance, in a stock control system it is probable that 20 per cent of the items will cover 80 per cent of the value. The question to ask is: Is it worth spending much effort keeping track of the 80 per cent of the items that represent 20 per cent of the value?

Notice the converse of the rule. Other applications abound. The technical name is the Pareto rule.

Not everyone can take advantage of this rule. The military might not be satisfied with the thinking that they could win 80 per cent of the battles with 20 per cent of the soldiers. That is why military equipment is of such high specification.

Similarly in government. It should be possible to control 80 per cent of the expenditure with 20 per cent of the effort, but public accountability demands control right down to the candle ends. Let us hope that the extra 80 per cent of effort required does not cost more than the last 20 per cent of expenditure it seeks to control.

The advantage to the business is that judgment and responsibility permit a reasonable view to be taken. As long as you can convince your boss that he can convince his boss that the saving on the cost of control is greater than any losses that might be occurring on the expenditure side, you will be highly regarded.

Cliff Dilloway

Cliff Dilloway is an independent consultant specialising in accounting software, taxation and payroll.

Computer Weekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, August 19, 1982

It all depends on how you use it

IT would seem that as long as there are computers there will be someone to fear them. Indeed there is a philosophical argument which holds that the fear came before the computers.

Be that as it may, the latest contribution to the computer as the threat to civilisation was made in last Sunday's Observer which interviewed Professor Joseph Weizenbaum of the Department of Computer Science at the Massachusetts Institute of Technology.

He is quoted as "coming close to believing that the computer is inherently anti-human – an invention of the devil." Strong words from a man who should know.

And Professor Weizenbaum, in the fashion of American academics, is very quotable. While the entire tenor of the article is one of nameless dread for a thing that most people don't understand, the computer, the professor manages to toss in one or two asides which show that he has a more than passing acquaintance with computers and the people who make them work.

The first is his reference to the "compulsive programmer", and before any DP managers start phoning us to lay their hands on one, we must point out that there is no known pool of these people waiting to fly to the aid of hard-pressed installations.

But everyone, at one time or another in their careers, has run across the sort of person who is so carried away by the mechanics of whatever he or she is doing that tinkering with it takes over a large part of the person's life. They soon become ready candidates for the great bores of the modern world anthology. When this over-enthusiasm strikes a member of the programming fraternity we are invited to find it ominous.

Where we believe that the good professor errs is to ascribe humanity's potential for doing the wrong thing to a machine. For his views tell us far more about himself than about computers.

Senior academics, facing the last years of their careers, are prone to a nagging sense of depression when they contemplate their lives and ask themselves if it was all worthwhile. The result in many cases is a condemnation of youth and of innovations that have been made since the speaker's own youth.

It is a very human failing – and a common one. But it leads to the mistake of trying to blame humanity's imperfections on its own instruments, in this case the computer.

It cannot be emphasised too often that the computer is just a tool. So is a knife, which as a wedge is the simplest tool known to mankind. There is no denying that a lot of dirty work can be performed with a knife, but it is difficult to peel potatoes without one.

No one looks forward to a time when the ungodly are made much more efficient by their use of computers, but we think Professor Weizenbaum and others like him should stop using the computer as the embodiment of their own dread of the future.

Computers will be used as we choose to use them, and whether this is good or bad depends on ourselves – not the machine.

Happy holiday!

ONE of the aspects of joining Europe that seems to have been wholeheartedly embraced by the computer industry is the habit of not doing very much in August.

While not suggesting that things are as bad as in France, where the whole country more or less closes down for the month, it is not common to find the senior staff of computer companies in their offices this month. Indeed, in the afternoon it would be possible to sustain the theory that the whole UK computer industry was represented by about a thousand telephone receptionists.

This impression is, of course, incorrect. There are a large number of people beavering away to keep their firms going. To them, our commiserations; to the rest – happy holiday.

1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by Mike Whittaker of Oldham, Lancs, who wins £5.

We have no need to shop, or post a letter, or drag the family to the garden centre. All we need to do is tap a few buttons. Best of all we need no longer stir ourselves to go to work. Workplaces have all become obsolete since we have all learned to converse by floppy disk.

The Guardian

LETTERS

Best of both with Prolog

I HAVE read with interest reports and discussions concerning the fifth generation project. Nobody seems to have noticed that Prolog can be combined with a more conventional language to provide the best of both worlds. That is exactly what we have done at Sussex University.

We now have a VAX-based system called POP11 (the name is a relic of an earlier PDP11 version and should perhaps be changed to something like POPLOG), which combines Prolog with an enhanced version of POP2, the language originally developed in Edinburgh for AI research. (POP is similar to Lisp, but has a more conventional syntax and for efficiency uses an incremental compiler rather than an interpreter.)

Our enhancements include richer syntax, a powerful pattern matcher, more general control mechanisms (eg CHAINTO, CHAINFROM), a fully integrated user-extendable screen editor and a built-in HELP and TEACH facility for accessing a large collection of online files.

Since POP11 is itself the implementation language (except for a machine-dependent kernel) the system is inherently transportable, and a Z8000 version has recently been installed (necessarily reduced to fit a small machine). Moreover, since the system is implemented in itself, the process of developing it involves using it. Hence most bugs get ironed out before ordinary users have a chance to suffer.

Further, since POP11 is fully interactive, system development and testing proceed far more quickly than with a more conventional implementation language.

Another unusual feature is that the language and its facilities have been designed for both totally naive users and very advanced researchers. POP11 is in regular use on a number of VAX installations both for teaching non-numerate first year arts and social science students and for advanced AI research including speech processing and image processing.

The Prolog subsystem is implemented in such a way that POP11 procedures can call Prolog procedures and Prolog procedures can call POP11 procedures. We therefore stand aside from theological debates about which sort of language should be used for designing intelligent systems.

Dr AARON SLOMAN
Reader in Philosophy and Artificial Intelligence
University of Sussex
Falmer, Brighton

The Editor welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. Letters may be cut.

Surprising language

THE inclusion of the DSM-11 Operating System with the Mumps Language under the heading Two Systems with Limited Appeal in your Software Month supplement on DEC software will have aroused a variety of emotions in some of your readers:

Surprise – in those associated with the many commercial organisations which use Mumps for all or part of their data processing requirements. Such companies would be able to demonstrate that Mumps is well able to support systems covering the whole range of commercial applications.

Dismay – in the many systems houses running major development projects using Mumps (including in one case a department of 40 staff). Those involved in marketing Mumps systems have for many years had to contend with uninformed comments

Disappointment – in those actively involved in the Mumps user community. Most computer journals, including Computer Weekly, recently covered the inaugural meeting of the Mumps User Group UK, which emphasised the growth not only in the number and variety of sites running Mumps, but in the number of implementations of the language (all to the Ansi standard).

To mention Mumps in the same breath as IAS, is to do a grave disservice to what is almost certainly the most powerful, most flexible and the easiest to use commercial software supplied by DEC.

DAVID HALL
Chairman
Mumps Special Interest Group
DEC Users Society

Finding the duplicates

I AM sorry that Jean M. K. Dufty (Letters, CW, July 15) is still living in the Dark Ages when duplicate names and addresses could only be removed from mailing files by hand sorting. In these enlightened times, by contrast, many people have not only noticed how irregular names and addresses are, but have actually spent years of effort in developing sophisticated software products to solve this problem.

I can assure Ms Dufty that the six examples she gives would be identified very easily by any respectable deduplication system; it should also be possible to find any further duplicates in which the house number is replaced by a house name.

Furthermore, enough firms disagree with her main point (that it is cheaper to post letters with duplicate addresses than it is to find them) for a massive address-processing service industry to have grown up, a substantial and highly-competitive part of which is dedicated to the removal of duplicates.

Surely, in the face of this, the statement "the computer could only identify exact duplicates" merits a place in your "strange sayings" slot in its own right!

PETER WILLIAMSON
Chipping Sodbury,
Bristol

Singular problem

LETTERS (CW, August 5) on mailshot sorting have thrown up a ghastly word, "deduplication". At the risk of being accused of one-upmanship, I would suggest that the word for which your letter-writers are presumably groping is "singularisation".

Could we not have a campaign to de-Americanise our antonyms; or, better still, to Anglicise them?

DEREK BRADLEY
Sanderstead.

Local area networks

I WOULD like to reply to the letter from David Favre on local area networks (CW, July 15). I was faintly amused that he chose marbles as a metaphor.

My recent experience of marbles, admittedly secondhand, is that intending players have to negotiate the rules for each individual game and arguing about them is more interesting than the playing – it certainly seems to require more effort. Maybe Favre subconsciously recognises the similarities!

Like so-called Democratic Republics, simple facts are often neither. Can anyone define "The LAN"? There are several varieties which have advantages and disadvantages. Any one of them may provide an answer to a particular problem. The real solution, however, is not the mechanism but the facility it provides.

DAVID HENSON
Corporate Product Consultant
Wordplex
Marlow, Bucks

DRI and the taxpayer

WRITING more in sorrow than anger, I would be grateful if you would allow us to state that DRI has not cost the taxpayer £32 million. The facts are simple. DRI, on its profit and loss account, recorded losses before tax of £20 million over the period 1980 to 1981 when development of the UPL joint venture was moving through its planned stages. In 1982, the NEB put in £12 million in cash to strengthen the balance sheet by improving the company's gearing as well as offsetting the cash effect of the cumulative losses due to reorganisation and prudently covering stock losses and obsolescence.

To add up the profit and loss figure with an injection of cash and represent this as a £32 million loss to the taxpayer is sheer nonsense.

In 1982, DRI has moved into profitability, as anticipated. UPL continues to build up its operations under Control Data's management and is operating at budgeted levels of profit.

The persistent attempts of your Financial Editor, Kevin Cahill, to discredit the investment in DRI, partners in UPL (the Control Data Corporation) and ourselves are not worthy of your respected journal. Any supposed "wall of silence" at BTG is due more to our embarrassment that your Financial Editor cannot do his sums and has created a controversy around a bogus figure.

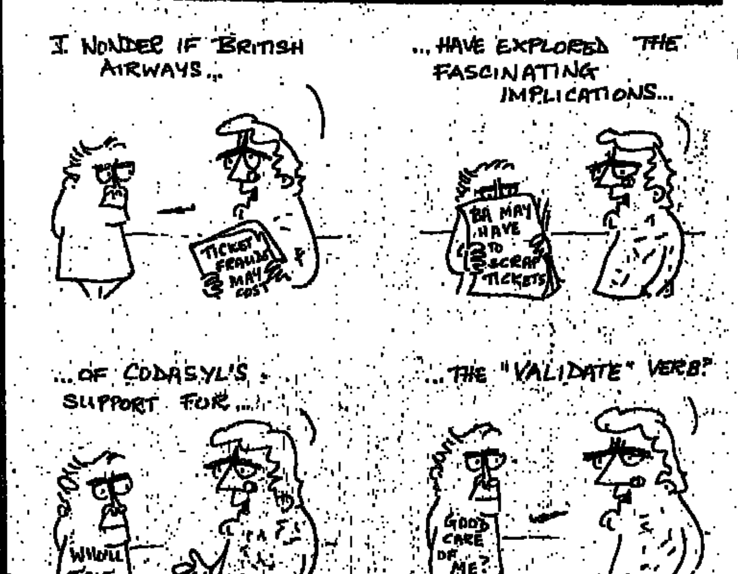
MAURICE CORINA
Director of Information
British Technology Group

Interface

WE would like to point out (Micro News, CW, August 5), that Westwood Computers did not provide a dedicated interface, but that this interface was, in fact, supplied by MDA Computer Systems in Redditch.

ROGER SINDEN
MDA Computer Systems

Liveware File by Don



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Manufacturers set their own standards for Cobol screen handling

by Philip Hunter

PROGRAM portability is like the rainbow – one is forever chasing it, yet infuriatingly it eludes the grasp. So it is with the development of Cobol, with manufacturers flying off to implement their own facilities as quickly as the Cobol committees can tie them together into a universal standard.

Take the case of the proposals for a "Validate" verb to take the chore of data checking from the procedure division and put it in the data division. It took the US Codasyl committee, whose decisions usually anticipate the definitive ANSI standards, eight years to write the Validate proposals into its Journal of Development.

And it will be two or three years more before Validate finally gets the ANSI passport to immortality.

In the wake of the Validate victory comes the battle of screen handling facilities in Cobol – vital in this age of distributed systems when one Cobol package might feed many different display screens.

A screen management task group set up by Codasyl has now produced a working paper of suggestions for screen management. These were discussed by Codasyl in May 1982 and a definite proposal is expected next spring.

But Codasyl is not the fastest working body in the world, and screen management proposals are unlikely to get into its Journal of Development until 1984 at the earliest, and possibly not until 1985.

"I suspect it would take the best part of a year to get the proposal into the Codasyl Journal of Development," confirms Codasyl committee member Phil Brown.

Meanwhile chaos rules in the absence of direction from Codasyl and ANSI, and manufacturers are setting their own standards. MicroFocus has a facility for setting up screens called Forms 2 for use with its CIS Cobol. It generates a Cobol program to set up screens and is driven from a menu of display options.

Codasyl is in two minds about the lag of the standard behind the developments of more ambitious companies. "It makes portability of programmers, and certainly of programs rather difficult," admits Brown. But he adds: "Sometimes one has to base the standard on real world experience and then the real world has to change what it is doing to the standard."

On the table at present are proposals to embed a screen management language (SML) into the programming language – in this case Cobol – although the proposals could equally well be adapted to another host language such as Fortran or Basic.

These suggestions are wrapped up in a working document called screen management facility (SMF).

SML operates on logical screens of information called "forms." Each form may fill several real screens on a live VDU, or on the other hand there may be room for several forms on one screen.

A typical form is a list of spare part numbers with a description of each.

In the program, the forms will be manipulated by use of Cobol type commands such as OPEN FORM, CLOSE FORM and READ FORM.

The forms are linked to the display screen by "panels", which are tailored for each brand of terminal. A form usually has a set of panels, called a layout, to map it onto a particular screen.

PIGGOTT . . . Could be difficulties making screen management in Cobol completely independent of the terminal.

Portability has improved since the day of three-inch magnetic tape, but it remains a problem.

Each form will have a layout to correspond to each type of terminal on which it is going to be used, or it may even have more than one layout to correspond to different displays on the same terminal.

In the case of a form consisting of a variable length list of parts for a vehicle, for example, one panel might give the position of headings, and another the box in which part numbers and their details are to be held. Both panels would depend on the size of display.

The operation of panels linked to a particular terminal is controlled by software written in ISDL, Independent Screen Description Language. This software describes how a form, which is independent of the terminal, relates to its layout of panels, which varies according to the choice of terminal for which the form is destined, or from which it has been filled in.

The idea of the panel is to shelter the programmer from the idiosyncrasies of particular terminals with their varying display sizes. In theory the choice of terminal is then irrelevant.

Real life however is different from theory and there are difficulties. Something like a pictorial personal profile would have to be tailored to some kind of display size, and so the only way it could be guaranteed to fit on to any terminal would be to adapt it to the lowest common denominator – the terminal with the smallest display and a minimum of facilities.

But the whole idea of SMF is to ignore the screen size and enable the programmer to make the best of what screen facilities are available.

According to John Piggott of S&PC, who chaired the BCS working party on the Validate proposals, an answer to the problem of moving big displays between terminals will have to be solved in the ISDL link. One option is wrap around, he says, to carry a display such as a graph over from one screen on to the next.

Forms are tailored to applications, not terminals, and are set up in the Cobol programs. But often the same form will be needed many times in different programs of the same system, so provision is laid in SMF for a form library.

There are two possible ways of implementing SMF at present being debated and both are described in the SMF working paper.

One is to bring the forms to the program at execution time. Forms would be stored on a file in compiled form and read when asked for by the program.

The other way is to compile all the forms needed into the program, and then proceed to execute the whole carbuncle together.

This second method of compiling a form each time it is used is more familiar with existing users, but is likely to be the less popular of the two with Codasyl. It has the advantage of enabling better code optimisation to be done, since the compilation can be dependent on the layouts being used in the particular program.

"If the form is already compiled, there is a need for red tape software," says Piggott. This "red tape" software would be needed when several forms are needed to fit into one display for example, to ensure that they are merged correctly.

But the first method has an important advantage that it can cater for a distributed system. "It is essential with different kinds of hardware," says Piggott. On a distributed system, a form might be held on a different machine from the program. Therefore it would be impossible to compile with the program.

An important aspect of SMF's validation of screen input, which will be based on the proposals for Validate verb recently approved by Codasyl. So although the screen management language is independent of Cobol and could be equally well embedded in a Fortran program, it is clearly biased in favour of Cobol.

PUZZLER

THREE
THREE
ELEVEN
ELEVEN
ELEVEN
ELEVEN
TWENTY+
SEVENTY

All ten digits are present in its alphametic. Your job is to find out which letter represents which digit, and thus reconstruct a valid addition sum. See page 37 for solution.

Lamsac computer panel names chief

LAMSAC, the Local Authority Management Services and Computing organisation, has named Steve Church chairman of its computer panel. Church is head of data processing services at the London Borough of Sutton's computer centre in Worcester Park, which is shared with Kingston-upon-Thames local authority.

The Sutton-Kingston computer centre, set up in 1967, was one of the first local authority consortia. Pooled resources have allowed it to keep up with technological developments – it was the first to install bar encoders into libraries and the first to introduce computers to local authority cash receipting, for example.

Church has been with the authority since 1967, when he joined as computer manager after holding a similar post with Surrey County Council. He has been in the computer industry for about 20 years, and has been acting chairman of the Lamsac computer panel for the past five months.

Joel Jervis has been appointed customer service manager at Harris Information Systems' International Division based in Slough, where he also heads the division's European Repair Centre and Logistics Group. He joined Harris ISID when it was called Sanders Data Systems, in 1974 as a service engineer.

Jenny Brown has joined MSA (Management Science America) as systems consultant. She was previously with ICL where she held the position of principal lecturer from 1979. Before joining ICL, Brown worked as a payroll systems analyst at the University of London and as a systems designer at Hoskyns.

Mark Powell has joined Peachtree Software International as technical support manager. He was previously UK software manager at Logabax. He was trained at Control Data Institute, and other jobs in the industry include director of programming at Universal (CMS), of which he was a founder member.

Allan Mack has been promoted to sales manager at Dicoll Electronics. He joined the company two years ago from Nuclear Enterprises to take responsibility for Dicoll sales in Southern England. The following year he moved to Chorley as field sales engineer when Dicoll opened its sales office there.

■ **Keith Compton-Bishop**, associate director and manager of Gordon & Gotch Computer Services has been appointed technical director of Gordon & Gotch Computer Centre. Four others have also joined the board. General manager **Roy Levens** becomes operations director; **John Heath** is systems and programming director; **David Smith**, previously an associate director and commercial manager of the company, becomes financial director; and **William Blenkinsop** company secretary, has been appointed sales director.

■ **John Rydz**, who re-designed Singer's electronic sewing machine, has been appointed vice-president for technology at Emhart. He joined the company in 1980 after serving as the vice-president of sewing products at Singer.

■ **Jim Jackson** has been appointed UK sales director at CTL. He was formerly director of the company's customer services division.

■ **Robert King** has been appointed technical communications engineer at Motorola in Austin, Texas. He has been with the company for six years in technical assignments including design and software development.

■ **Leo Pot**, formerly a marketing manager at Data General in the Netherlands, is to head the Interface Group's sales and promotion office which has just opened in Amsterdam. Interface organises the Codex series of exhibitions.

■ **Jun Utsumi** is taking over as acting managing director at Omron Terminals (UK), British subsidiary of the Japanese electronic cash register firm. The appointment follows the resignation of **Peter Russ**. Utsumi was previously planning director and has been with the UK company since its formation two years ago.

■ **Geoffrey Marlow** has joined Typeshare as sales manager. He was previously general manager of Itek.

■ **Phil Carr** has been appointed manager, manufacturing technology, at Rediffusion. He was formerly production manager at Taylor Instruments.

■ **Stephen Gredley** has joined CTL from Systime as senior sales executive.

■ **Peter Cook** has been appointed managing director at Hi-Tek distribution the Newey & Eyre electronics distributor. He joined Newey & Eyre Electronic Distributors in 1980 to set up a new high technology distribution company and became Hi-Tek's general manager when the company began trading in 1981.

■ **Julian Garrett** has joined MSA as systems consultant. He joins from Ford Motor Company where he was in financial systems development analysis.

■ **Floyd Bradley** has been appointed vice-president, Europe, at Computer Pictures. He joined the company in January.

■ **Margaret de Lattre** has joined Text 100 PR as account executive. She is a graduate of Birmingham University.

DIARY

SEPTEMBER 8
OTL Gives Voice to Information Management. Meeting on OTL's Information Management Processor. Institute of Information Scientists WP and computer information systems special interest group. OTL, London. Tel Helen Harris on: 01-229 5069.

SEPTEMBER 14
Expert Systems. Speaker Alex d'Agapeyeff. IDPM West London to Oxford branch. Bell House Hotel, Beaconsfield.

SEPTEMBER 19-24
Industrial digital and microprocessor-based control systems. IEE. Vacation School at Balliol College, Oxford. Details from IEE, 01-240 1871.

SEPTEMBER 23-24
Information systems – analysis and design working party. BCS. Open University, Milton Keynes. Details Guy Fitzgerald, 01-854 2030, ext 327.

OCTOBER 5
The impact of the new technology on management. Speaker David Fairbairn, director of NCC. IDPM Scottish branch-British Institute of Management. Merchants House, 7 West George Street, Glasgow.

OCTOBER 6
Impact of new technology on management – challenges and implications of IT for the workplace. Speaker Ted Cluff, secretary-general IDPM. IDPM Scottish branch – Institute of Management. Lecture Theatre, College of Commerce, Aberdeen.

OCTOBER 12
Visit to Thames Valley Police Computer Centre. IDPM West London to Oxford branch. Thames Valley Police Computing Centre, Kidlington, Oxford.

JANUARY 5-6
Viewdata. Conference on the state of the art. Institute of Information Scientists WP and computer information special interest group. Details Mrs Bird on: (051) 645 2000 ext 8611.

CONFERENCES

■ SPL and American company Teknowledge are teaming up to present seminars and a short course on knowledge engineering and expert systems in London this autumn. A three-day course on building expert systems entitled Fundamentals of Knowledge Engineering is aimed at DP professionals and will be held from September 20-22. Course content will include the architecture of knowledge systems, inference and problem solving, knowledge representation and acquisition. A one-day executive briefing called Knowledge Engineering in the 1980s will be held on October 28. Details from Wendy Allen on Abingdon (0235) 24112.

■ SALES and sales support personnel, either new to sales in the computer industry or requiring refresher coaching in professional selling techniques may be interested in a three-day course to be held in London by the NCC. Sales Training Workshop, from September 28-30, October 19-21, and November 16-18, is aimed particularly at staff of small to medium-sized companies. It aims to help delegates make better use of face-to-face selling time and to improve the professional presence of the sales team when dealing with clients. It covers the total selling cycle and costs £333+VAT, with a 10% reduction for NCC members. Details 01-353 4875.

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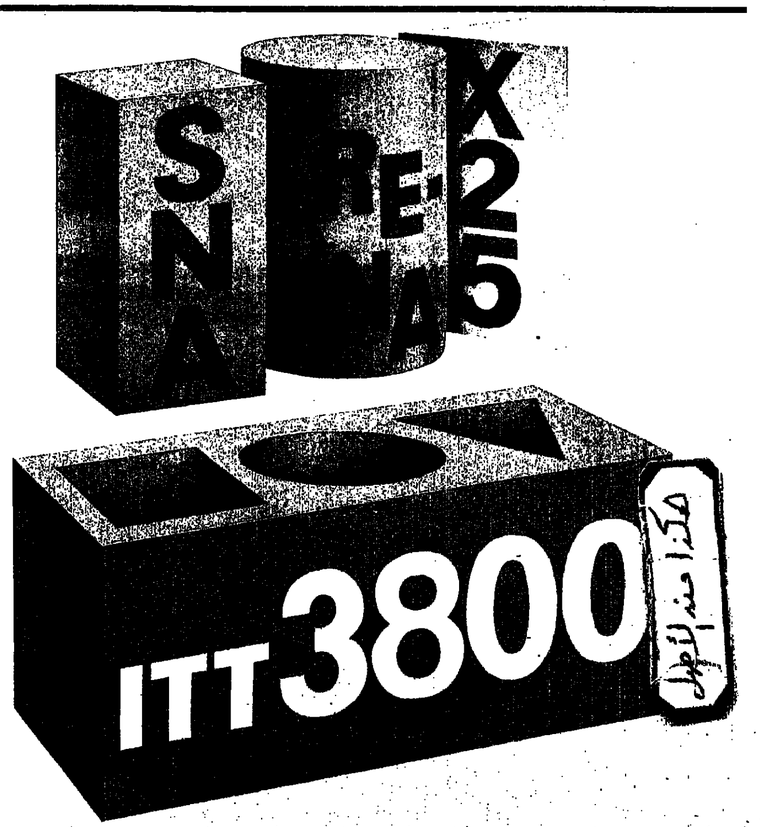

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Hoskyns steps in to save ops from dole queue

by Andrew Thomas

SEVENTEEN jobs have been saved at a government computer installation because control has been handed over to Hoskyns Systems, rather than closing the department. The government is closing a number of its training boards, and the Distributive Industry Training Board's Stretford, Manchester, computer centre is one destined for the axe.

Hoskyns facilities management deals will be familiar to readers of Op Spot – the company takes over all aspects of day-to-day running of computer installations from the host company, usually resulting in a complete transfer of the workload to one of Hoskyns' three major data centres spread across the UK.

The DITB discovered that the cost of handing over the ICL 2950 and its staff to Hoskyns was exactly the same as the budgeted spending involved in managing the rundown itself. A major plus in favour of the Hoskyns deal was that the 17 staff faced with redundancy would be redeployed within the Hoskyns empire rather than joining the dole queues.

Hoskyns runs three major data centres at Gravelly Park, Birmingham, Regents Park in London, and Trafford Park, Manchester. Linked to these three sites are a number of satellite installations providing a wide range of hardware. When new installations are taken over, the whole network is assessed to see whether savings can be made by moving any of the satellite machines into one of the main centres.

Hoskyns plans to run the mainframe and its associated data entry equipment on-site for six months before being relocated to its regional data centre at Trafford Park, Manchester. Hoskyns has already upgraded the 2950 and introduced bureau work on it to take up spare capacity.

Not only have the DITB operations staff been assured of continuing employment, they have been given added job interest with the opportunity working on any of the Hoskyns sites throughout the UK. Several hundred staff have joined Hoskyns as the result of facilities management deals and now occupy positions at all levels.

What's your game?

THE Computer Weekly Adventure clearing house is now a month old, and chief clearer Joe Sharkey reports that he has already dealt with 20 requests. It appears that most people were users of PDP-11s, which made his job reasonably easy.

What he needs now is updated and enhanced versions tailored for other architectures. If anyone has new versions which they wouldn't mind sharing, get in touch with Joe at 33 Woodcroft Avenue, Mill Hill, London NW7.

ADVENTURE

Joe has also filled in an important gap in my vocabulary – the definition of a *grue*.

"The grue is a sinister, lurking presence in the dark places of the Earth. Its favourite diet is Adventurers, but its insatiable appetite is tempered by a fear of light. No grue has ever been seen by the light of day, and few have survived its fearsome jaws to tell the tale."

Sounds like my old DP manager.

Could there be a spy in this van?

Calling all high-tech industrial spies

OK you lot. It's your turn to help me. Rather than my startling you with amazing facts, feats and foibles from the Wonderful World of Computing, I want some information from you.

You've all tried the listen-to-the-computer-on-a-transistor-radio scenario, so are no doubt aware of the plethora of squeaks, clicks, squeals and groans emitted by the average mainframe in the course of its duties.

Two questions spring to mind on this subject. Firstly, do computers near powerful sources of electromagnetic radiation such as radar installations, radio and TV transmitters and CB radios suffer interference from them? Reports from the US suggest that this may be the case, and there is currently much discussion on legislation to prevent problems arising.

The second question interests me more: If you can listen in to a computer processing its workload, can you decipher the noises and extract data from the RF signals?

The prospect of the industrial spy secreted in a truck just outside your installation, armed with a radio and a micro to decode the signals, is an intriguing, not to say frightening, prospect.

And if the high-tech spy can eavesdrop on your computer, what's to stop his beaming the precious data back at it from the comfort of his truck in the car park outside?

I would very much like to hear from anyone who has experienced problems with electromagnetic interference and computers in order to judge the extent of the problem in the UK. Spies are also welcome to contribute.

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Donald Kennett opens this four-page feature by taking a look at some of the problems of distributing sensitive data

A problem area with a special fascination

DISTRIBUTING computing is as fascinating – and problematical – as distributing wealth. Both require careful forethought and planning to avoid chaos and to ensure that those involved derive maximum benefit from new arrangements and methods.

Computers are the core of the information revolution in the same way that engines and motors were the core of the industrial revolution. Their application at an increasing rate is giving rise to at least as many support industries and specialised jobs as those which have evolved around motors and their application.

There are already many specialised activities within the computer manufacturing and service industries and among users. But even at this stage of fairly widespread computer use, we cannot foresee many essential requirements of the future, just as our forebears could not foresee that traffic lights, parking meters and the DVLC would be essential to the application of just one type of motor.

Data networks have generated much academic activity since the early 1970s. More recently, local area networks have sprung up as an almost entirely separate sphere of interest. Cable television networks which predate the commercial use of computers, have acquired a new relevance to computing and its future enlargement into information services of innumerable kinds.

Meanwhile computer languages, operating systems, hardware architectures, coding schemes, component technology and storage methods have been developed to increasing levels of sophistication, occasionally going up a blind alley through failing to take the others into account.

From a starting position in which manufacturers and users alike took the view that "computers are programmable – so you can make them do what you like" (although not many applications were cost-justifiable), more and more rules and guidelines have evolved to cover different aspects of the generalised mass of tasks to which computer processing can be applied.

Each new set of guidelines appears as a frustration to the uninitiated, who just want to get stuck into making the machine do what they want. But properly conceived guidelines – in the form of standards and other recommendations – will make each new element of computing more reliable and better able to relate to other elements.

Database is an important approach to using stored information to maximum effect. Used loosely, the term "database" implies only a collection of data, but a collection of unorganised data is difficult to access effectively. Principles have been developed, and continue to be developed, which make the data accessible in a variety of ways for a variety of different purposes.

Expertise in this area is currently much sought after. Distributing the database calls for further expertise.

Distributing sensitive data calls for additional attention to error control, access control, user authentication and other security measures such as encryption, each of which has been subject to specialist development. Sometimes the result of this development is a well-understood set of principles, to which those implementing a computer system are advised to adhere, and sometimes it is a product or service which can be used with a minimum of specialist knowledge.

The International Standards Organisation published its seven-layer model for Open Systems Interconnection with the aim of giving users as much flexibility as possible in building their systems, of stimulating competition between the suppliers of the various elements of a computer systems, and of allowing users to interconnect their systems. This has been endorsed by the Consultative Committee on International Telephony and Telegraphy, and has aroused widespread interest while work on defining the individual layers continues. One of the results of the continued work, however, has been the realisation that the model could do with an extra component – to define the network management function – which spans six of the seven original layers.

The whole model only describes how one system may relate to another when communicating across a network or data link. It does not help to define how the previously mentioned areas such as database, encryption, or operating systems will be handled.

The thrust of distributed computing has been to take access to computing facilities to users throughout an organisation, then to place the control of different aspects of those facilities in the relevant parts of the organisation. It is likely to be extended to allow the use within the organisation of resources based outside it and vice versa.

This is likely to lead to further specialised areas for standardisation or product offering, such as the assignment of value, billing and, further down the line, computer-based price negotiation.

One influential source of potential standards in areas such as order entry and invoicing is American Bell, the new subsidiary of AT&T. Its proposed new service, Advanced Information Service/Net One, is to provide this kind of processing for its users on top of the more mundane services of message transmission and code and protocol conversion.

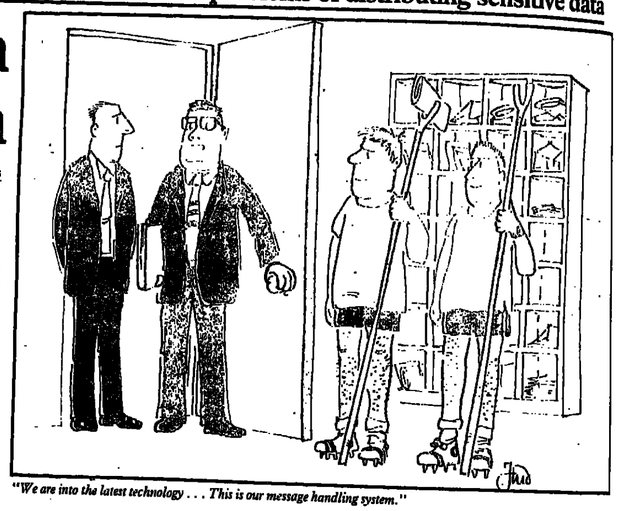
New companies will continue to be set up to provide practical solutions to badly understood needs in distributed computing, just as new companies introduced the S-100 backplane bus, the Apple microcomputer, the financial data presentation and manipulation program Visicalc and the CP/M operating system. All of these addressed ill-defined problems in the past and enjoyed a warm welcome as a result.

As systems become capable of accumulating and exchanging increased amounts of information, it becomes increasingly difficult to keep track of it. Database management systems, data dictionaries and query languages are all aids to accessing information, but they offer insufficient help in assessing its significance and extracting meaning from it. New tools will have to be designed to do this.

When humans interpret a mass of information, they do so by summarising, inferring, deducing and sometimes by inventing new concepts to make sense of it. How soon will it be possible to do these things using software?

Who will sell the first concept formation utility package? What kind of new information manipulation language will double the sales of the machine it runs on, or the popularity of the operating system it runs under?

Underlying both the wonderful and the mundane possibilities is economics. Falling hardware cost is the biggest impetus behind distributed computing, although there are parallel influences such as a complementary trend towards decentralised styles of organisational management.



"We are into the latest technology . . . This is our message handling system."

The computer, like the motor car, has given rise to a large number of support industries and specialised jobs.

Microcomputers muscle in on mini and mainframe networks

Distributed methods must utilise the micro, says Peter Robinson

ALTHOUGH first spoken well over 2,000 years ago, the much quoted phrase "I am made all things to all men" is an apt description of what people believe to be distributed data processing.

As a term, distributed data processing is self-explanatory. The emphasis should be on "processing", but many now use it fairly loosely and have extended its meaning to cover data collection. This has only succeeded in leading to confusion which has been compounded by the advent of processor controlled key-to-disc systems – are these processors, or collection devices, or both?

Distributed data processing means that within a company or group of users there are a number of processors, be they IBM mainframes or Apple micros. They do not necessarily have to be connected by any form of communications but are simply distributed by application, and user requirement or economics.

The term distributed data processing evolved from the 1960s with the early development of sophisticated minicomputer systems and terminal networks. Today, the UK market value for computer equipment and peripherals is around £1,500m. There are reckoned to be 185,000 machines installed in 100,000 sites.

The Institute of Manpower Studies claimed in 1980 that 83% of the hardware installed in the UK was accounted for by small value minis and micros. If this figure is to be believed today, there are more than 150,000 systems of this type in use up to a value of £30,000. Interpolation from other IMS figures indicates that there are also around 28,500 small business systems with value between £30,000 and £250,000. The remaining 6,500 systems include large networks and mainframes.

The annual growth in the total amount of hardware installed in the UK has averaged 29% in the last seven years. The average number of installations per site has increased from 1.46% to 1.85% over the same period. Greater applications recognition and downwardly spiralling hardware costs have meant two things. Micro or minicomputers are not sold just to small users with limited application needs; and the typical mainframe computer now has a more powerful and cheaper central processor supporting many terminals.

Even though the phrase distributed data processing was being freely used in the early 1970s, most of the networks it was used to describe were relatively simple. It was a question of putting the minicomputer where it was needed and sorting out any communications problems it created at a later stage. The processing solution in these cases would usually be a physical one relying on batch processing and the manual transportation of bulk data.

Today a very different story can be told. In theory, users of local minicomputers should now be able to enjoy local control of their system, lower costs and fast application response while interactively accessing the central processing computer for much larger databases such as a company's master customer files.

A typical example of this is IBM's APL, which enables a user to develop his own applications at local level without the need to rely on central programming staff. In each case the mini makers' principal philosophy has been one of making his system user friendly.

This approach has produced a whole host of what can be loosely described as own-brand networks from major minicomputer suppliers. These comprise minicomputers linked together both interactively and on a batch processing basis and providing each user with the ability to access any mini in the network as if it were his own. The suppliers' main philosophy has been to convince data processing managers that small is beautiful, local is best.

The most prevalent example of this philosophy is the building society at branch level. Each branch is able to access both the central database and any other branch. Hence a customer wishing to deposit or withdraw savings or simply requiring entry of accrued interest in his passbook can now accomplish this at any branch within the network. As the transaction is printed directly into the passbook arithmetical human error is eliminated and customer waiting time is kept to a minimum. With the advent of the super-mini, networks such as these have been implemented without any reference to the traditional concept of the large central mainframe.

The evolution of distributed data processing covered the requirements and demands of users, the claims and interests of manufacturers and led to the decline in the cost of hardware and the increasingly sophisticated application of communications. But what about unplanned developments?

The ideal distributed data processing networks should be constructed around totally compatible hardware. At most it should contain no more than two different manufacturers equipment. But how often does it happen that way?

It could even be said that distributed data processing has "returned computing to the people" especially for the users of large mainframes. Once they were the machines that dictated to the user, telling them when to complete their returns, how to fill in their forms and even, in the case of OCR handprint, how neatly to write. With distributed data processing the user now has total control. He is able to do his own thing . . . and then learn the hard way.

The cost-efficient use of the microcomputer in distributed processing networks combined with cluster controllers designed to unscramble even the most tightly woven manufacturer's protocol is, perhaps the most interesting aspect of computing today.

Undoubtedly many functions of computer processing can be best be carried out at local level. Today the "worm will turn" philosophy applies for the data processing manager who can see the more complex functions such as word processing and financial planning being solved by the micro or intelligent terminal with its own local storage. He can rest easy in the knowledge that there will always be a need to access something else – a device which is readily available, and which has the kind of storage and processing capabilities that the micro does not yet have.

The micro's versatility, cost effectiveness and ease of justification to produce the early stages of a distributed processing system will mean that such networks will become increasingly micro-prevalent at the expense of dumb terminals and mini systems as this decade reaches maturity.

● *Peter Robinson is marketing director of General Computer Systems.*

Local area networks are not the solution to every business problem

Rod Bird is sceptical about LAN makers' claims

LOCAL area networks – or LANs – have received as much, if not more, publicity than any other innovation in the history of DP. But despite the razzamatazz, there has been no noticeable rush to actually install them, and the number of LANs up and running in the UK today is still tiny.

Investing in a LAN will bring some immediate and undeniable benefits. The user will also get lots of "futures" – scope for future technological improvement by the supplier. But a LAN could present some tricky problems, which, if not anticipated, might prove expensive.

Any local area network will save on the amount of cabling used to carry data communications around a site. LANs make much more efficient use of a cable's "bandwidth", or information carrying capacity, than do conventional computer networks. They allow a relatively large number of devices to "talk" down the same conductor. Typically, such a network is designed to support a maximum of 500 or 1,000 terminals.

Conventional computer networks have a much lower concentration of terminals per conductor. On average, each transmission path leaving the premises of the typical computer room is used to serve no more than two or three separate terminals, and a sizeable majority of terminals linked to their host computers over dedicated, unshared, links.

> **'Installing a network with the latest cable will seem like a marvellous idea until the whole network is put out of action when someone accidentally tries to link up a bulldozer'**

During the last decade a host of products and software developments have been aimed at improving the terminals-per-link ratio on remote connections. But "goodies" like multiplexers, concentrators, and multi-channel modems, have been designed against the backdrop of the American private circuit (leased line) tariff structure. The savings attainable in improving the ratio on local connections have rarely been as obvious, so until recently comparatively little effort has been applied to the problems of local connection.

For a LAN the user will need to install less wires in and around the premises. The snag is that many LANs are designed to use expensive coaxial cable, which could cost £5 per metre or more. There may be no second source for the manufacturer's cable, and consequently no competition keeping the price down. At least today's telephone and coaxial cables are stock items in most cable suppliers' warehouses. And there are well-established techniques for jointing, repairing, and fault isolating in everyday cables such as multicore telephone wire. Installing a network with the very latest cable may seem a marvellous idea at first but will appear less attractive if the whole network is out of action for two weeks because someone accidentally tries to link up a bulldozer.

Both baseband and broadband local networks can show a major advantage over any conventional system because of their much higher speeds. LANs can almost all shift bits at rates in excess of a million per second, whereas most in-house links, whether they are direct, or via modems or line drivers, are limited to a maximum of 10,000 bits per second.

It is difficult to get manufacturers of conventional computers, terminals, and modems to contemplate speeds over the accepted "top limit" of 9,600 bits per second. The higher bit transfer rates of local area networks could offer major benefits, if applications include high-volume tasks such as graphics, file backups, or lots of electronic mail.

Adding new devices to a LAN should also be much quicker and easier, as should moving a device from one part of your site to another. With conventional "star" networks, the connection of new terminals often means pulling in new cables, buying modems or line-drivers, and making changes to the software on the host computer. Frequently, a new communication path is needed even though there may be devices already installed in the area – even on the same desk. This shows the inefficiency of such networks. With a LAN, however, connection is a trivial matter, provided the cable passes close to the planned location for the new terminal. For example, Ethernet cable has a marker on it, every two metres or so. Devices are attached to the network by clamping an interface unit over the marker. Another cable connects the device to the network cable, allowing the device to be installed up to 50 metres away from the network cable. An interface can be unclamped, and the terminal serving cable and "transceiver" can be carried across the site, and simply clamped on to another free point on the Ethernet cable with a minimum of disruption to the rest of the system.

A device attached to a baseband local network should be able to communicate with any other on the network. Such intercourse may be confined to a very basic interchange of data, but this is a considerable improvement over ordinary "star-shaped" layouts, in which all communication is ordered on a strict "masterslave" basis without the possibility of one terminal sending a message to another, except via the host.

The absence of such restrictions on most – but not all – local nets can be put to the user's advantage in many ways. For example, peripherals like high-quality printers and electronic filing systems can be used by any terminal on the LAN, rather than being accessible only by a single device, or group of devices. The percentage of the time any such network-attached resource is in use will almost invariably be higher than that of an equivalent unit on a conventional, non-shared system.

'Apart from the obvious cost-benefits of eliminating the need for a large number of frequently idle peripherals, the flexibility of this sort of architecture can also ease the path of expansion. Not only does the pooling of resources allow, for example, the total printing capacity of a site to be closely linked to its total printing demand, but when demand looks like outstripping the installed capacity, another printer can be easily added.

The mode of operation for most LANs allows for "peer-to-peer" transmission. This term describes the ability of devices like minicomputers and word processors to talk with each other without the intervention and supervision of a mainframe. This will help simplify electronic mail and message handling, which have hitherto been stunted by overheads associated with the central processor. The end of the master/slave era in computing will, inevitably, spawn a huge number of intercommunications, though it will dramatically increase the usefulness of every device on the network.

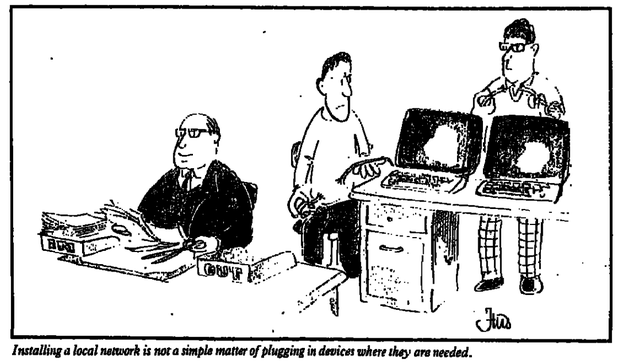
Obviously, there are some highly persuasive arguments for the concept of the local area network. The arguments against are less often heard, perhaps because there is more money to be made in providing LANs than in talking people out of them. The arguments against installing one can be roughly divided into two categories, conceptual and practical.

First the idea of funnelling all data communication around a site using a single cable means a highly efficient usage of the cable, but the impact of cable failure, or even a device failure, could be serious. The suppliers of LANs go to great pains to minimise the possibility of a terminal, or network interface, "going bananas" and disabling the whole net, but it cannot be ruled out.

Equipment failures aside, it would not be too difficult a task for someone intent on disrupting a site's data traffic to do so. Computer crime is claimed to be one of the world's fastest growing hobbies. This could be especially significant on a broadband net, which is capable of supporting devices like closed-circuit TV cameras, smoke detectors, and alarms.

Second, the peer-to-peer ability of networks in the Ethernet mould

● Turn to page 16



Installing a local network is not a simple matter of plugging in devices where they are needed.

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Martin Hewitt checks over the British Telecom runners in the race to supply users with cost-effective networks

The race is on, but the winner depends on your DP needs

TIRED OF planning a distributed data processing – or DDP – network? Then take a day off and let's go to the races. The main event today is the DDP championship hurdles, a two horse race between the old favourite Public Switched Telephone Network (PSTN) and the bright new two-year-old Packet Switching Service (PSS). Both networks are owned and trained by British Telecom, and there is a lot of prize money for the winner.

Let us first go down to the paddock and compare the qualities of our two contenders in today's data communications race.

PSS, being the younger of the two networks, is a bit of a dark horse, but we know something about its capabilities. PSS is a high speed data transmission service which runs to international standards. The grandfather of PSS is the well known Telex which for decades has been the only international network dedicated to data transmission.

To use Telex, an operator must dial the number of the remote destination and start sending data at a leisurely pace of 10 characters a second from prepared tapes. The more modern user of PSS makes the call by electronic means and dashes data backwards and forward at speeds between 30 and 5,000 characters a second.

Using PSS, all data is put into blocks or packets surrounded by the internationally agreed X25 protocol. This protocol gives the user error checking, an internationally agreed network addressing scheme, and speed independence across the network. Because PSS conforms to X25 standards, it is relatively easy to link it to other national X25 networks as they become available. Already it is possible for a terminal user in North America to connect to any host computer attached to PSS in the UK. Most DDP operations involve some long distance communications links, and PSS is up and running and looking for punters.

When compared to PSS, old PSTN has much more form and is well known to anyone with a telephone installed in their home or office. Using PSTN you can make a call to most of the developed countries of the world simply by dialling the country code followed by the local number. The connection thus made can be used to talk to your favourite aunt or for data communications via modems at speeds up to 240 characters a second. If a PSTN data user is worried about errors, he must select one of a variety of protocols written by the major computer manufacturers.

A first look at the runners leaves us with the impression that PSS is much fitter than her elderly rival. Clearly PSS provides many more facilities for her backers than those provided by PSTN. The fast automatic connection of calls from one computer to another is far more simple if both are connected to a packet switching network. However, the number of destinations available to a PSTN user vastly exceed those accessible on PSS.

Looks can be deceptive, so let us go to the starting post and see how the runners perform on the track. Ease of mounting is important to a rider, so let us see how easy it is for a DDP user to connect to the two networks.

> **Dialled connections are much more familiar to most DDP users than the intricacies of PSS datalines, but do not be fooled into thinking that it is difficult to connect to PSS – it's just different**

Access to PSS may be either by a leased line to the nearest network node or by a dialled PSTN connection for users of "dumb" asynchronous ASCII terminals using modems or acoustic couplers. The most effective use of PSS is made by those with "packet mode" terminals which conform to X25 protocol standards.

Not many Packet Mode Terminals are available, so British Telecom has provided facilities in its nodes or packet switching exchanges (PSEs) to put asynchronous ASCII data into X25 packets. This type of facility is known as a packet assembler disassembler or PAD.

If you require more than occasional dial-up use of PSS a "dataline" is much more convenient. A dataline consists of a leased line between the subscribers premises and the nearest PSE with two full-duplex modems one at either end of the link.

For those wishing to access PSTN, all that is required is an exchange line going to the nearest local telephone exchange. The modems required to use this line for data communications may be either rented from British Telecom or purchased outright from one of the many suppliers of proprietary modem and other communications equipment.

As we approach the first hurdle a look at the runners shows that despite a slow start, PSTN is catching up quite a bit of ground on PSS. Dialled connections are much more familiar to most DDP users than the intricacies of PSS datalines, but do not be fooled into thinking that it is difficult to connect to PSS – it's just different.

To equip a horse for riding you must spend money on saddles, bridles, stirrups and so on, which the equinine community lumps under the generic heading of tack. In the same way you need some basic tack to make use of PSS and PSTN. Although not much X25 or packet mode equipment is available on the UK market, you can buy privately supplied PAD devices which enable users of existing computer equipment to communicate with PSS in X25 protocol.

The diagram shows how private PADs such as the JNT and ENA products enable asynchronous terminals and computers to connect directly to an X25 network. The DDP user should note that in addition to PSS, a private packet switching network could be used for internal company data communications. You can also see that where a host computer such as a Prime is equipped with an X25 communications software package, no additional hardware is required to make connections to or from PSS.

The tack required for PSTN is much less demanding both in terms of cost and availability. To keep human intervention to a minimum, only two basic items of equipment are required, the auto-answer modem and the auto-dial unit. In an attempt to make the human ear obsolete, the auto-answer modem dispenses with bells ringing and signals the computer to respond to an incoming call. This is normally done by connecting a computer port to the modem and starting the transfer of data across the link without interference by mere mortals.

The auto-dial unit attempts to replace the human finger. It dispenses with the need to connect a call manually, accepting the required number directly from the attached terminal or computer and producing the appropriate signals required by the local telephone exchange to make the connection.

One typical auto-dialler on the UK market can accept up to 130 numbers from a computer and proceeds to dial them on four exchange lines until the list is exhausted. A typical DDP application of this type of equipment is the collection of data from point-of-sale terminals during the night when calls are cheap.

A look at the running halfway through the race shows PSS still in the lead with PSTN again falling further behind. Lacking the glamour of PSS there are relatively few new products designed to streamline a dialled network. But one recent announcement of a new international modem standard should brighten the scene for PSTN users. This is the V22 BIS standard giving 2,400 bits per second operation in full duplex mode on dial-up – twice the speed of existing auto-answer modems. PSS is benefiting from almost weekly new product announcements from computer and communications equipment suppliers, all claiming X25 compatibility in the hopes of backing the winner.

To win money you must invest a little first. The minimum stakes to back PSS and PSTN are widely different. To attach a packet mode terminal to PSS will cost a minimum of £450 for installation, compared with only £80 for installation of a PSTN exchange line. But you will need modems for the data connections on PSTN, and installation of these will cost about another £80 for each unit.

Both PSTN and PSS incur a quarterly rental whether you use them or not during the period. For a PSTN exchange line the rental is only £21 a quarter whereas a packet mode dataline on PSS will set you back a hefty £375 a quarter. But do not forget that a single X25 connection is capable of handling dozens of calls simultaneously.

The positions are changing rapidly as our runners take the final turn. PSTN is closing fast on the leader, now that the minimum stake has been taken into account. Many network planners are put off by the heavy initial investment required for PSS but they must look at the facilities which are offered.

As the two rivals enter the home straight, let us see what effect the cost of running them will have on the result. You pay for PSTN only in terms of the time of the call and the distance of the connection. The costs of the call take no account of the speed or volume of data carried. But PSS users pay only for the volume of data and a small fixed hourly rate for each data connection.

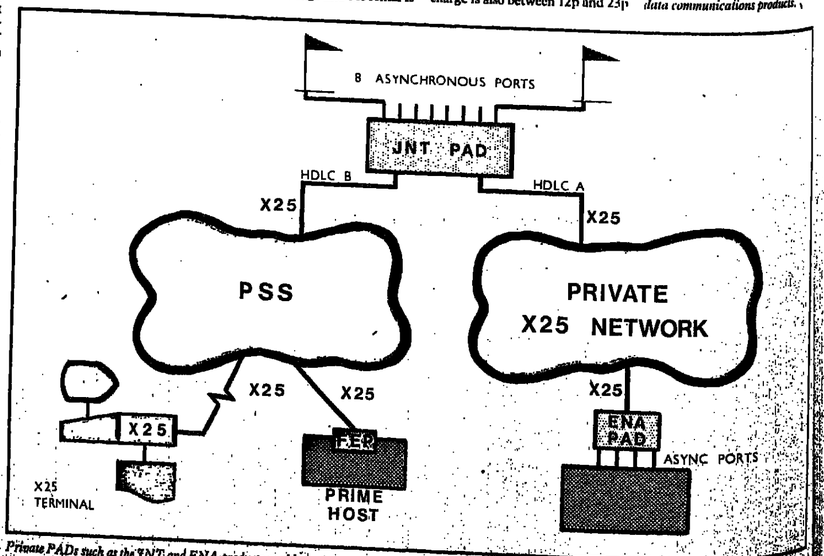
PSS charges are independent of distance in the UK. Call duration charges on PSS are between 12p and 23p per hour depending on the time of day. The data volume charge is also between 12p and 23p for carrying up to 64,000 characters over the networks. A comparison between running costs becomes even more difficult when you consider that PSTN charges for a 30 minute call vary from 30p for a cheap rate local call to a staggering £9 for a peak rate call of over 56 kilometres distance.

With the finishing post in sight our two runners jostle each other for the lead on usage charges. PSS is severely handicapped by the weight of high line rental charges while PSTN stumbles on the treacherous ground of high call duration costs. And as they cross the line it's...

The result you must work out for yourself. Look at your own network, get the true facts on costing from British Telecom. Count your hours of connection time and at what rate you pay to measure the speed of desired transmission. Only by mapping your network on to the two alternatives can you work out which is the best bet for your own distributed data processing needs. In the end, it is a question of "horses for courses".

● *Martin Hewitt is managing director of Jaguar Communications, which specialises in X25 and other data communications products.*

HEWITT . . . Users must work out the costs for themselves.



Private PADs such as the JNT and ENA products enable asynchronous terminals and computers to connect directly to an X25 network.

LANs are no cure-all

● From page 15

is limited to a very basic form of intercommunication. If all the devices for a LAN are acquired from the same supplier, there should be little trouble in interconnecting them, but although devices from two different manufacturers may be described as attachable to the same sort of LAN, they may not immediately be able to engage in a full exchange of data, files and programs. The reality of "compatibility" often falls short of manufacturers' claims.

The fact that installed local nets are thin on the ground brings with it a number of practical consequences, such as lack of user experience in running them.

How reliable are LANs? How do they cope with high bursts of traffic? If they give trouble, how easy is it to find out where faults are? Only those already operating local nets know the answer.

There are no standards for local networks, and despite – or perhaps because of – the fact that many different groups throughout the world are attempting to write appropriate standards, there is unlikely to be any meaningful compatibility for years. This is unfortunate, not only because communications of all sorts depend on the mutual use of compatible protocols, but also because any local networking system which does not become standardised will never offer the benefits of suppliers competing to supply attachable devices.

Communication with devices outside the LAN will be provided for in the LAN suppliers' "gateways", according to the suppliers. But no manufacturers has demonstrated a convincing, multi-purpose gateway. The technical problems in making one are enormous, but without such a lifeline to the outside world, local networks can restrict their users.

Local networks cannot yet be thought of as the logical solution to any business problem.

A wary approach and a healthy scepticism about manufacturers' claims are probably the best prescription for anyone contemplating a LAN.

● *Rod Bird is telecommunications manager with the Lucas Group.*

Thomson Holidays plans to provide more processing power to travel agents in future. Colin Palmer gives details.

Tops in the holiday business with videotex links to 2,000 agents

THOMSON Holidays, the country's biggest tour operator, is gearing up to make its £20 million a year package holiday business directly accessible to travel agents through videotex televisions in agents' offices. The Thomson Open-line Programme (Top) will go live nationally in the Autumn with 2,000 ABTA members.

The company has been using computers since the late 1960s and it introduced a real time holiday bookings system during 1976. This system, Tracs (standing for Thomson's Reservations and Administrative Control System) allowed agents to book any holiday through their local office, making administration more efficient and bringing significant savings in communication costs to agents.

Ten regional offices, each with between six and 22 Datalogic 3270 VDUs, were able to access the firm's twin IBM 370/158 computer centre via Post Office tariff T leased lines.

Staff answered telephone calls from local travel agents and interrogated Tracs to check on holiday availability, make bookings and a host of other activities related to tour operations.

The drawback was still that the agent had to rely on a person-to-person phone link to the local Thomson office and at times, such as the launch of the major summer or winter programmes, the traffic would swamp the reservations people and regularly jam the local phone exchanges.

The next step was to put the agent directly online to the computer system and a technology working party was established in 1979 with the brief to put this into effect. The team investigated a number of options, but eventually, in September 1980 concluded that videotex provided a speedy and cost-effective solution.

A pilot project Cars (Computerised Agent Reservation Service) was planned and went live with 66 travel agents in March 1981. It was the world's first videotex "gateway" system.

Cars gives the travel agent limited booking and availability searching facilities, but its main function was to enable the agents and Thomson to learn about the practical and technical aspects of linking videotex screens with Tracs. The result of this exercise has been a firm commitment to videotex as a communications medium and a set of objectives for the new system.

It had to be comprehensive and easy to use, following Prestel user standards where possible, appeal to both travel agent and the client with whom the agent is dealing, offer a reliable and fast service, improve travel agents' access to Thomson and keep travel agents' costs to a mimimum.

Where possible, it had to offer standard communication interfaces to allow for Thomson's continued expansion plans and reduce administration costs per holidaymaker.

After an investment of £2 million in new hardware and software, the 1982 version of Tracs is very different from its earlier versions. Figure 1 shows the network as it will operate under Top.

Any terminal which has a Prestel interface and an alphanumeric keyboard can link into the Top system. There are several purpose-built travel agent systems on the market which have a Prestel interface (eg Modulas, Travicom), otherwise Philips (14 inch) or Sony (nine inch or 14 inch) videotex terminals with alphanumeric keyboards may be rented from Visionhire and Telefusion.

The system is designed for use with colour, although monochrome sets can be used.

Travel agents will be allocated a telephone number for videotex access to Top. This will link them to their local Thomson regional centre, either directly, or via an OOA (out of area) exchange line which gives local call access to pockets of agents situated an "a" to "b" call rate away from the centre.

At the centre the call is connected via Master Systems videotex 1200/75 bps modems to Thomson's custom-built regional network concentrator (RNC).

This microcomputer, the lynchpin of Thomson's network, was designed by MicroScope and built by Newbury Labs.

The basic unit comprises five 64K Z80A microprocessors – one master and four slaves. Each slave board supports four videotex ports, so 16 parallel videotex conversations can be carried out simultaneously.

The flexible design of the RNC means that MicroScope will be able to produce 24- and even 32-port versions. The RNC fulfills a number of functions: It controls a Prestel Gateway look-alike interface between Tracs and videotex terminals; stores up to 10 frequently-used frames ("welcome", "goodbye", "hours of service" etc); performs character echo, cursor control, refresh and other Prestel Gateway-type functions; and acts as an intelligent PAD (Packet Assembler and Disassembler), communicating in X25 (the protocol used on British Telecom's Packet Switched Service) down Thomson datalines to the computer centre.

Thomson's new videotex bookings system in use at Mike Francis Travel in Reading.

Thomson plans at least 17 RNCs on it live network, offering a total of 272 videotex access ports to Tracs. This is in addition to the 200-plus conventional VDU links spread across the regional centres.

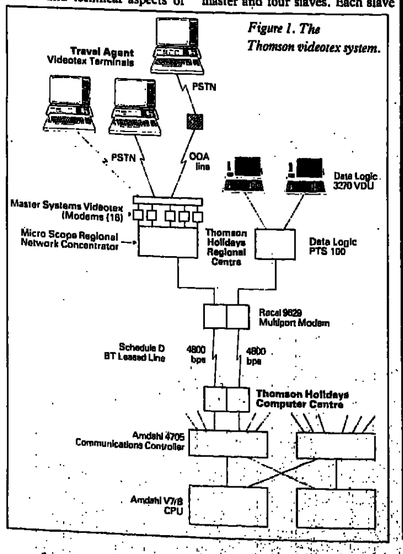
Videotex and 3270 data share Thomson's leased lines by the use of Racal multiport modems, which allow each datastream to run at 4800 bps and this could be increased to 9600 bps.

Thomson's systems group has developed Tracs in a number of areas. The group has designed videotex control programs based on Prestel Gateway protocols and has amended and added to existing VDU-based applications functions. These allow interactive real time transactions using videotex formats – colour, 40 x 24 character screen, form fill, menu selection and so on.

With this sophisticated and powerful system the company hopes to break new ground in the area of videotex communications.

● *Colin Palmer is Thomson Holidays' commercial director.*

Figure 1. The Thomson videotex system.



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BOOKS — *Selected by Maggie McLening*

Fifth generation review a hard task for readers

Fifth Generation Computer Systems. Edit T. Moto-Oka. North Holland (Oxford). £20.00.

THE publication of this work, containing as it does all the relevant papers to date on the Japanese Fifth Generation Project, comes as a substantial relief to the reviewer.

Ever since Computer Weekly ran reviews of the project taken from the Tokyo conference papers last year, it has been plagued by requests for the documents.

Well, here they are. And what you make of them depends on what you think of the Japanese project.

If, like many people, you consider the project a fundamental new departure in computer design, offering a whole new dimension for the industry in the Nineties, then ploughing through the papers is a must. I use the word "ploughing" advisedly.

The book is a collection of conference papers, the majority of which are translations from the original Japanese, containing, as conference papers do, an endless series of repetitions. In many cases, the reader's task is made more difficult by doubtful translations.

The Japanese see the project as the only route to national survival for a country without natural resources other than ingenuity.

And the outline of the future system is nothing if not exciting, most of all because there are no proposals to advance into totally untried technologies.

The Japanese see the Fifth Generation as a silicon-based VLSI engineered era of supercomputers, accessed by everyone via hand-held devices which will enable users to communicate with the system in common English or Japanese.

The central machines, which will contain up to 1,000 processors each, will operate on non-von Neumann architecture and rely to a great extent on inferential logic working at 10,000 million instructions per second (mips).

The project is clearly laid out in the papers, and the timescale is regularly referred to.

The Japanese expect to have their first inferential logic machine which will be based on a very much enhanced version of Prolog (an advanced high level language used in artificial intelligence), within three years.

They expect to have developed the main elements of the man-machine interface four years later, and the first Fifth Generation systems will be in production three years after that, in 1991/2.

Kevin Cahill

Official guide to the Pet

The Pet Index. Wing Commander Michael A. F. Ryan. Gower Publishing. £12.50. 194pp.

THE Pet Index, which claims to be both officially approved by Commodore and probably the first micro index yet produced, provides comprehensive listings of source references to the Pet/CBM microcomputer.

The book covers 17 different publications – some 290 issues in all from 1977 to a late 1981 cut-off point. Even so, the author admits to be far from confident that he has unearthed all references in the 2,100 database listings.

Apart from being a Pet enthusiast the author is a wing-commander in the RAF. This connection possibly shows through in the range of listings which include JoyStick and Flying Instruction Program. Other offbeat listings include a Lord Lucan search, football pools forecasting and dog racing programs. *A.S.*

How to establish an electronic office

A Guide To the Electronic Office. Malcolm Peltu. Associated Business Press. £8.95, 185pp.

MALCOLM PELTU is rapidly becoming the standard authority on the electronic office and could be in danger of running out of publishers. Having produced a book for the NCC on the theme, he has now turned his attention to the CSA where he was involved in an in-depth study of the office information needs of 10 organisations representing a cross-section of public and private activities.

The project, which was supported by Langton Information Systems and other members of the CSA, has resulted in a well-presented and highly realistic guidebook on establishing long-term office automation strategies, short-term action plans and system evaluation.

Few books on office of the future technology have been so packed with practical information covering products, systems and social and environmental relationships.

As can be expected from such a study, there are comprehensive glossary and index listings together with pictures.

However, there appears to be a marked reluctance on the part of all involved to promote the merits of microprocessing or associated software packages such as financial modelling or planning. This lack of software promotion extends to the otherwise excellent coverage given to word processing.

But whether it is a matter of discovering the meanings of Azerty (not apparently to be confused with Qwerty), Holographic stores or graceful degradation, the book comes into the "all you ever wanted to know and more besides" category and can be confidently recommended to office managers, executives and even DP professionals.

Alan Simpson

Videotex still waiting for breakthrough

The Videotex Revolution. Alan J Mayne. October Press. £31.00.

DESPITE its importance videotex, in the form of information from centralised databases made available via the phone and TV set, remains a pregnancy rather than a birth.

But this is not the view expressed by Alan Mayne in his excellent reference book. He describes videotex as rapidly becoming one of the most important contemporary communications media.

But Roy Bright in his foreword to Mayne's book acknowledges that some might question this assertion and the faith which lies behind it.

He does so because he acknowledges the most annoying fact about videotex, which is the absence of a breakthrough into the mass consumer markets in Europe and North America.

For those who attended the early public seminars on Prestel conducted by Butler Cox before audiences of up to 800 against the expected 200, the failure of the service to gain public support remains frustrating.

The early chapters of Mayne's book, which is remarkably lucid and uncluttered, deal with definitions and descriptions of videotex technology.

Mayne includes extensive cross-references and a comprehensive bibliography of other books available on the topic.

However it is in chapter 14 that Mayne finally comes to grips with what many perceive to be the root cause of the failure of the current services to take off.

He blames the economic recession, but generously quotes a series of other viewpoints, along with books or sources in which those viewpoints appear. None, however, seems to agree with what a journalist from the Economist warned during one of the early Butler Cox meetings. He said that low cost was fundamental to achieving mass market penetration.

The economics of viewdata, as it then was, needed a mass market to make it viable, even by the Post Office's own estimate. Yet the service was launched in the luxury price bracket. Right or wrong in analysis – and it looks suspiciously like the man from the Economist was right – Prestel has not taken off. Indeed it continues to lose about £6 million a year and more than one voice has suggested that come the public sale of BT, there will be no further place for a loss-maker of this sort.

But this book, even at £31, is one of the most useful references on the topic to appear to date.

K.C.

Obvious way to business efficiency

The Book of Business Communications Checklists. John Bittleston and Barbara Shorter. Associated Business Press. £8.95. 166pp.

THIS is one of those infuriating books which, by stating the obvious, manages to convey a constructive approach for an orderly life. The snag is, of course, that advance planning is often not feasible, especially in the computer industry.

A whole section, for example, is devoted to planning an overseas business visit. In real life, business executives barely have time to grab their passports and cheque books before racing off towards Heathrow. Checklists are matters which they later wish they had consulted.

Much of the book is just good old-fashioned common sense. Answering the telephone promptly and clearly; finding out if the recipient has telex facilities before sending a message; preparing notes before dictating a letter or report.

However, DP management should find the letter and report writing sections of considerable benefit, especially where formal or legal factors apply.

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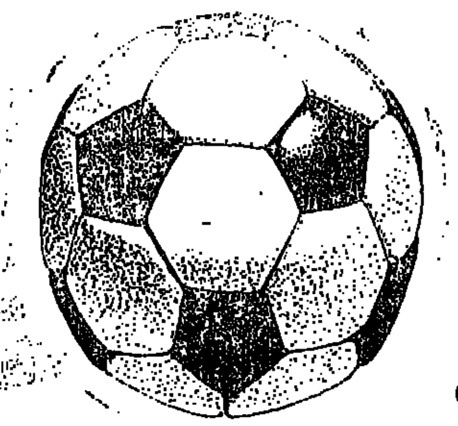

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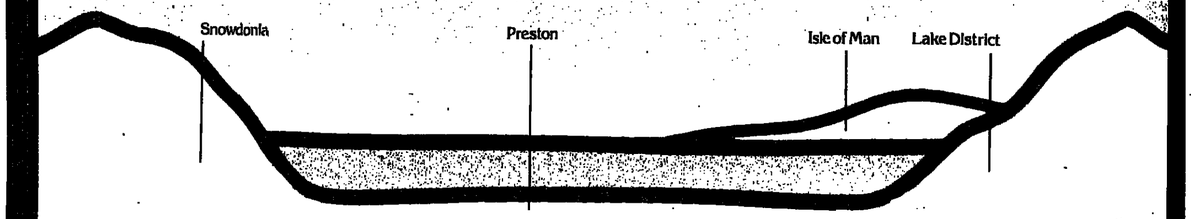

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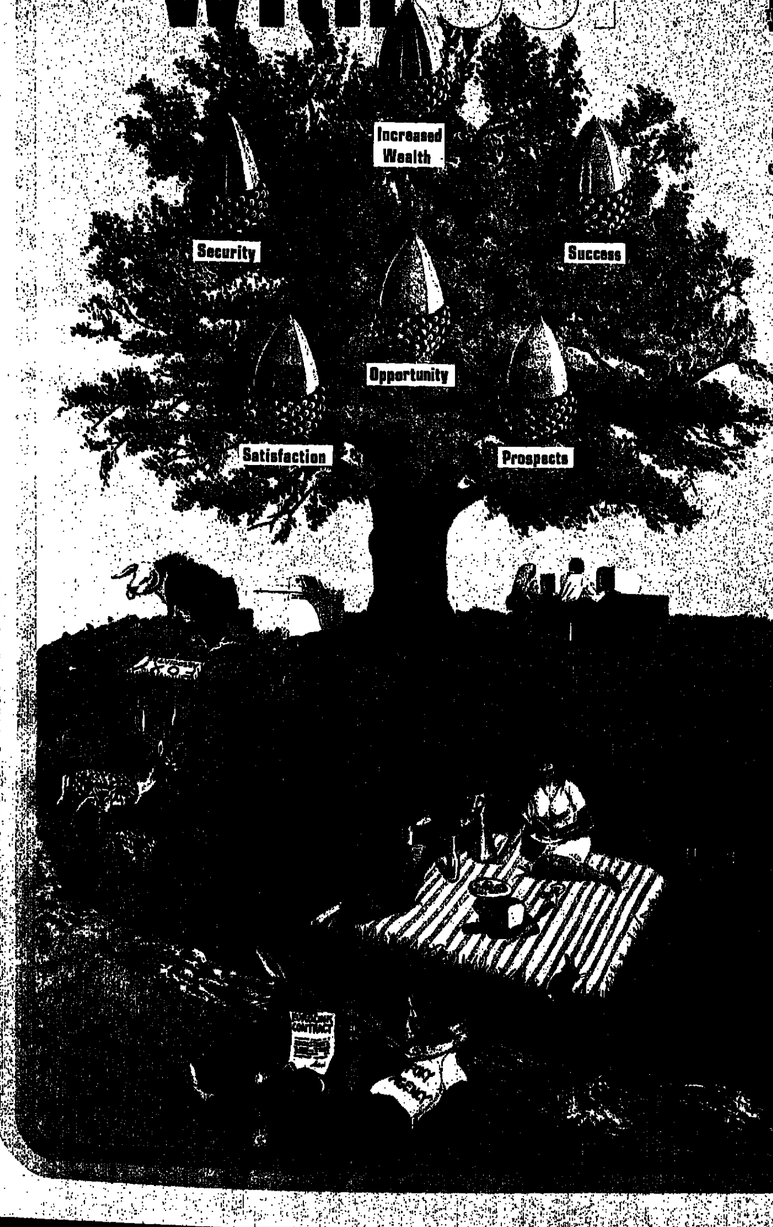

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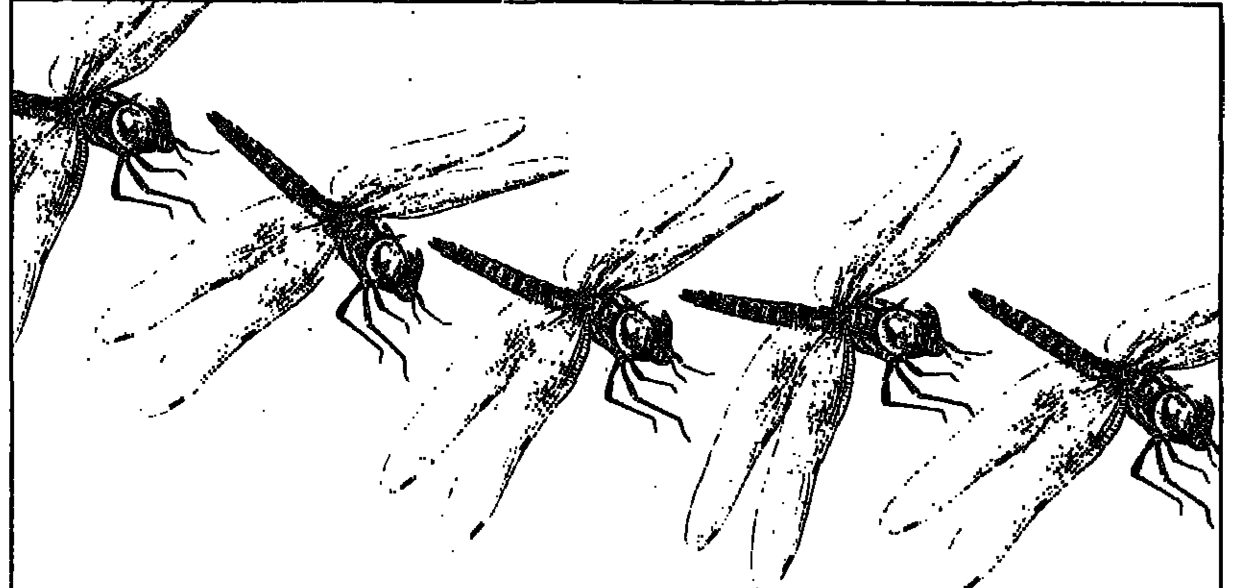

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BUPA

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ANNOUNCEMENT

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Project Eighty Three has the facility for appointees to gain experience in more than one project area, to help with job interest and career development.

Starting salaries currently range up to **£16,500,** and benefits include mortgage subsidy, season ticket loans, and of course free BUPA!

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More details are in the computer trade press this week and next week.

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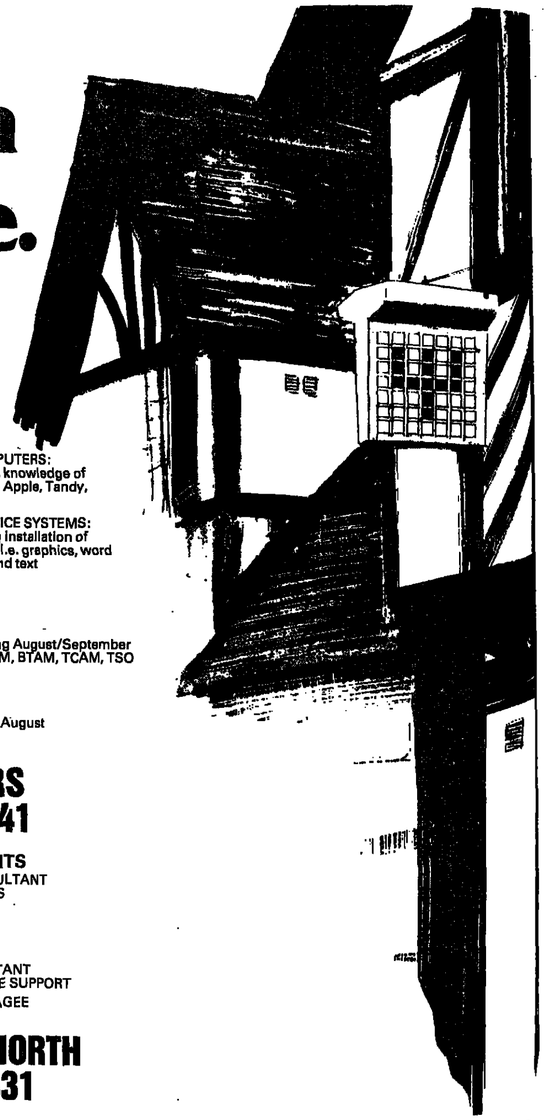

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SYSTEMS ANALYST/DESIGNER

Scottish Provident has a vacancy at its head office in Edinburgh for an experienced Analyst/Designer to take part in the continuing development of computer systems. Applicants should have several years' experience of systems analysis or design. Experience of data communications or database systems would be helpful as would experience in life assurance in the conventional or unit-linked field.

Scottish Provident's main data processing is carried out on a Burroughs mainframe but we also make extensive use of key-to-disk equipment and minicomputers.

The starting salary will depend on qualifications and experience but will probably be in excess of £9,000. The successful applicant will also be eligible for promotion to Senior Analyst/Designer in future.

Non-contributory Pension and Life Assurance Scheme and other attractive fringe benefits including a Staff House Purchase Scheme. Applications should be made in writing to: The Staff Manager, The Scottish Provident Institution, 6 St. Andrew Square, Edinburgh EH2 2YA.
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Ngee Ann Polytechnic

The British Council and ICL are working with the Government of Singapore to develop this prestigious Centre, which will be equipped with the latest state-of-the-art ICL 2988 mainframe computer. The Centre will have the responsibility to train up to 200 students per year to the approximate level of the BEC/TEC HND Programme in Computer Studies. The Director (designate) of the Centre is Rodney Shaw.

Teaching Group Specialisations
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Candidates should have had several years' experience in the organisation and teaching of computer studies at the level of Higher National Diploma. They should have held a senior post in a relevant British Educational establishment.

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Candidates should be qualified computer professionals with significant experience in the teaching of Computer studies to the level of HND. Candidates who have relevant experience in more than one area of specialisation will have an advantage. A generous package of salary and expatriate benefits will be negotiated with each successful candidate. Posts will begin from December 1982 or June 1983 for two- or three-year appointments.

Interested candidates should phone (01) 580 6572, extension 41, or write to overseas Educational Appointments Department, The British Council, 90-91 Tottenham Court Road, London, W1P 0DT, for detailed particulars of post as soon as possible. Please quote reference 82A 76-82.

THE BRITISH COUNCIL
(0619)

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HP 1000 Fortran Senior Analyst Programmer
IBM SHADOW Programmer
IBM PL1 IMS Programmers and Analysts
IBM DL1 COPICS VSAM Analyst Programmers
ICL ME29 TME IDMS TDS Analyst Programmers
Honeywell 64 IDS TDS COBOL Analyst Programmers
VAX VMS Systems Programmer/Communications Consultant
DOS/VSE VM Systems Programmer
IBM S23 Analysis or Programmer
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(0609)

SPANISH THE LANGUAGE ALL CONTRACTORS SHOULD LEARN!

No, its not another micro language for journalists to write endless pages about. If you'll excuse the pun it refers to Span Computer Contracts, one of the UK's leading contract agencies.

Span has been helping contractors for over 6 years and has earned a reputation in the industry for fast, efficient service, prompt payment, financial advice with a friendly approach to business. We've listed below some of our current requirements written in your language. Why not give us a call, you'll be glad you did.

IBM 4341 OS/VS1 CMS DL/1 COBOL	Progs	(London area)
IBM 4300 MVS CICS DL/1 COBOL	Progs	(Home Counties/Midlands)
IBM 4300 DOS/VSE CICS DL/1 COBOL	Progs	(All areas)
IBM 4300 MVS IMS PL/1	Snr Progs	(London)
IBM 4341 OS/VS1 IMS DB/DC COBOL/PL/1	Progs	(Midlands)
IBM 370 OS/VS1 PL/1	Progs	(Home Counties)
IBM 370 IMS MVS PL/1	Progs	(All areas)
IBM 3033 IMS/VS MFS TSO/SPF COBOL	Progs	(Midlands)
IBM 3030 IMS PL/1 or COBOL	Progs	(London & North)
IBM MVS CICS IMS	Systems Progs	(All areas)
IBM OS/VS1 CICS DL/1	Systems Progs	(All areas)
IBM IMS	Consultants	(London & Midlands)
IBM MVS	Consultants	(London)
IBM Series 1 EDX EDL COBOL	Progs	(Home Counties/Midlands)
IBM 8100 DPPX COBOL	Progs	(Midlands/North)
IBM 8100 DPCX ASSEMBLER	Progs	(Midlands/S. West)
IBM 8100 DPCX ASSEMBLER/COBOL	Progs	(Midlands/Surrey)
IBM 5280 DE/RPG	Progs	(London/Midlands)
IBM System 38 RPGIII	Proj.Ldr/Progs	(London/Home Counties)
IBM System 38 RPGIII	Progs	(All areas)
IBM System 34 COBOL	Progs	(London)
IBM System 34 RPGII/COBOL	Progs	(London)
Siemens (IBM equiv) COBOL	Progs	(London/Essex)
TANDEM series	All levels	(All areas)
NCR Neat 3/COBOL	Progs	(All areas)
WANG/VS COBOL	Progs	(London area/North)

ICL 1900/2900 QPAC	All levels	(London)
ICL 1900 GII COBOL	Progs	(London/Home Counties)
ICL 1900 GII COBOL/PLAN	Progs	(London/Home Counties)
ICL 2900 VME/B IDMS COBOL	Progs	(London/Home Counties)
ICL 2900 VME/B IDMS TPMS COBOL	Progs	(London/Home Counties)
ICL 2900 VME/B COBOL	Progs	(London)
UNIVAC SYSTEM 80 OS/3 COBOL	Progs	(Midlands/South)
UNIVAC 90/30, SYSTEM 80 IMS 90 COBOL	Progs	(All areas)
UNIVAC 1100 DMS TIP COBOL	Progs	(All areas)
HONEYWELL DPS 4 COBOL	Progs	(Home Counties)
HONEYWELL LEVEL 64 IDS/TDS COBOL	Progs	(All areas)
HONEYWELL LEVEL 66 IDS/TDS COBOL	Progs	(London/Home Counties)
VAX 11/780 VMS COBOL	Progs	(London)
VAX 11/780 FMS DATATRIEVE COBOL	Progs	(London/South)
PDP 11/70 RSTS/E BASIC +	Progs	(London)
PDP 11/70 RSTS/E BASIC +, +2	Progs	(West Country)
PDP 11/70 RSX BASIC +, +2	Progs	(Home Counties)
PDP 11/70 MUMPS	Progs	(London/Midlands)
INTEL 8080, 8086 COBOL	Progs	(All areas)
INTEL 8086, MDS ASSM, PLM	Progs	(London/Home Counties)
TEXAS INSTRUMENTS T1990	Syst Progs	(London/Midlands)
HP 3000 COBOL	Analysts/Progs	(London/Midlands)
HP 3000 IMAGE, QUERY, VIEW, COBOL	Progs	(London/Home Counties)
PRIME COBOL	Progs	(London/North)
PRIME SERIES	Syst Progs	(All areas)
MICRO MPM MICROSOFT BASIC	Progs	(Home Counties)

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We are finding more and more requirements in the Midlands and North of England for good experienced contractors.

To meet this increased demand one of our Consultants's Amanda Francis, is concentrating on your individual requirements to ensure continuity of employment. She would like to talk to contractors wishing to work in those areas or those of you currently working in permanent positions who are thinking of pursuing a contract career. Call Amanda on 01-734 7394.

Thinking of Moving into the Contract Market?

Span has gained a reputation for helping first time contractors to start their new careers. If you are interested in having a confidential discussion about the contract market please complete the coupon and send it to Span Computer Contracts, Freepost 37 London W1E 6UZ.

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CW/8/82

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Z80 CP/M EXPERTS

City of London

£9,000—£15,000

Our client is a microcomputer manufacturer whose product is at the forefront of technology. The growth of this public company over the past year has been phenomenal, and to keep pace with this expansion, they wish to recruit staff at a variety of levels to work in their advanced technical software base in the City of London

Technical Support Manager:
You will become closely involved with the hardware development as well as develop and maintain the software for Z80-based micros. You will provide customer support, software development and support expertise and will be required to liaise closely with both technical and sales staff within the company. You must have a thorough knowledge of Z80 and CP/M using languages such as Basic, PASCAL, Assembler and COBOL, and be familiar with software tools such as MAC and Wordstar. You will represent the company at exhibitions and presentations so you must be articulate, presentable and self motivated. Each applicant will be judged initially on their technical ability, however this position can be moulded to accommodate either a proven manager or an applicant with the potential to manage other staff.

Technical Programmer:
You will have a similar type of background to that described above, and will probably be working for another micro-manufacturer or in the industrial development of micro-technology. Again, sound expertise of Z80 and CP/M is required and you will have the ability to learn new techniques quickly in order to make a positive contribution towards future projects.

Space is limited yet we have plenty more to tell you, so for more information, please contact Ann Swain on 01-734 7394 (or on 01-785 7615 evenings and weekends) quoting reference number 4902.

WARWICK WOODWARD | A SPAN GROUP COMPANY
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*Z80 is a registered trademark of Zilog (UK) Ltd. *CP/M is a registered trademark of Digital Research

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There are many opportunities that never reach the advertising pages, and although we have listed some typical vacancies, to discuss your career in detail, please complete the coupon and forward it to us as soon as possible.

System 38 Analyst/Programmer
RPG II or III experience with a manufacturing environment North London to £11,000.

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London & Middlesex based, any machine experience to work for manufacturer 7-10 yrs DP experience.

Senior Analyst/Programmer S.W. London
Reporting directly to DPM, must have 4 years RPGII and some MAAPICS experience. Up to £13k.

DEC Systems Programmer London
A PDP 11/70 Consultancy is looking to recruit a systems programmer with RSTSE, BASIC+ experience. Salary to £15k.

System 34 Operator/Data Controller
Central London commodities company looking for an operator. Salary to £7k. **No shifts.**

Junior Programmer City to £10k
A leading bank is looking for an IBM COBOL programmer with a little CICS DL/1 experience (approx. 18 months).

IMS Professionals to £16k
At all levels for large financial Company in South London. COBOL exp in an IMS DB/DC Data Analysis environment

Snr Programmers to £13k + quality car + bonus + bupa
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Systems Programmer VSE C. London
A minimum of 2 years systems programming experience up to £13,500.

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PL/1 Progs & Systems Programmer to £11k
All levels of PL/1 progs with or without IMS required. City.

I would like a confidential discussion about my career prospects.

Name: _____
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Present Title: _____
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No of yrs in DP _____
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ICL 2900 TPMS IDMS COBOL	Essex	ASAP 102
IBM COBOL OS	Hants	ASAP 29
ICL VME/B SUPPORT	Europe	ASAP 103
MICROS	(Various Sites)	ASAP
ICL CIS COBOL DRS	Berks	ASAP 104
ICL IDMS VME	Berks	ASAP 105
IBM COBOL IMS/ADF	South London	ASAP 21
ICL 2900 COBOL IDMS	Wilts	ASAP 106
ICL 2900 DESIGNER	(Various Sites)	ASAP 107
INSURANCE ANALYSTS	Hants	ASAP 46
IBM SYS. 34 RPGII	S. Midlands	ASAP 43
ICL ANALYST/PROG. IDMS	London	ASAP 108
ICL IDMS SUPPORT VMEB	Kuwait	ASAP 109
IBM 4300 (PL/1) TOTAL	Leics.	ASAP 30
ICL 2958 VMEB	Dublin	ASAP 110
ICL 2900 VMEB COBOL	North/Hants	ASAP 111
DEC or VAX MUMPS	Holland	ASAP 40
HONEYWELL 64 COBOL IDS TDS	Staffs.	ASAP 44
ICL TEAM LEADER STRONG IDMS	Berks	ASAP 505

Further details on request

Please telephone Joan, Roger, Caroline or James on Amersham (02403) 22201 or send your c.v. to Plymouth House, London Road, Amersham, Bucks, HP7 0HE.

ALL REPLIES QUALIFY FOR OUR MINICOMPUTER DRAW

(0645)

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Systems Software Engineers, with between two and five years' software design experience gained in a distributed processing environment, are urgently sought by a major supplier of micro-based industrial control systems. All applicants should possess at least one degree, preferably, but not necessarily, in a numerate discipline and be fluent in an assembler and a high-level, block structured language such as "C" or Pascal. There is a strong preference for candidates with exposure to Z80 or T.I.9900 based systems although applications are also sought from those with hands-on experience of any leading MDS. All positions demand good verbal and written communications skills as there will, inevitably, be an element of customer contact during design studies and commissioning. Man-management experience is especially interesting to our clients who can guarantee rapid advancement into managerial positions for those of sufficiently high calibre. Ref: L/32/A

Business Systems Analysts

N.E. Surrey : Salaries to £15K + Car

A leading Systems House and Consultancy, which specialises in the supply of minicomputer-based business systems, is currently seeking additional Business Systems Analysts. Suitable applicants will probably be employed by a Systems and Software-House or Consultancy where you are involved in the analysis, design and tailoring of accountancy or financial applications software for end users. In particular you should have experience of at least one minicomputer, preferably Wang, DEC PDP11 or IBM System 34. These positions will involve a degree of travel to client sites and consequently you will be provided with a company car. Ref: L/32/B

Telecomms Consultants

Greater London : Salaries to £17K

A highly regarded supplier of integrated Data and Telecommunications Systems wishes to recruit a number of Designers and Senior Consultants. Ideally, candidates should have had experience in the evaluation, selection and integration of PABX/LAN equipment or be currently employed as a Consultant with a Systems House or Product Vendor. All respondents must show previous experience of both man-management and budgetary control. Additionally you will be called upon to provide a total consultancy service from strategic studies, through to recommendations, on-site implementation and final acceptance. Good personal presentation skills are of paramount importance since you will be expected to project recommendations at senior management level. Ref: L/32/C

Firmware Programmers

Swindon : Salaries to £10K

A number of **Firmware/Software Programmers** are sought for this West Country Research and Development facility. All candidates must have at least an H.N.D. or B.Sc. qualification and, additionally, one year's software or firmware programming experience. Candidates should have a thorough knowledge of Micro-Assembler and in particular have recently designed an I/O driver as an interface to the system peripherals. For the more software related positions candidates should have designed a communications protocol. Whilst particular hardware experience is not all-important there is a stated preference for candidates who have worked in an environment where Z80/Z8000, Motorola 68000 or HP 9835 hardware is utilised. Ref: L/32/D

Comms S/W Designers

South Wales : Salaries to £11k

A world-leading supplier of telecommunications equipment has a number of requirements for Communications Software Designers to join its Research and Development facility. All candidates must possess at least one degree in Computer Science or Electrical/Electronic Engineering and have had two years, or more, in an industrial environment. Past responsibility for hardware implementation, as well as software design of low-level protocols up to, and including, Transport Service will be favoured. Applicants should, preferably, have hands-on experience with a leading MDS and be fluent in an Assembler and one or more high-level block structured languages. Ref: L/32/E

Micro S/W Development

Cambridge : Salaries to £12k

Programmers and **Software Team Leaders** are urgently required to assist in the development of applications and systems software for a new generation of microcomputers. Successful candidates for the positions of Team Leader will be fluent in a high-level, block structured language and have specified and implemented at least one compiler. Working in-house, their responsibilities will include the design, development and commissioning of systems software and the evaluation of commercial packages submitted by sub-contractors. Programmers will also be expected to offer fluency in a block-structured language and, preferably, have gained the majority of their post-graduate experience on micro-based systems. High standards of documentation and the ability to conform to tight deadlines are required of all respondents who, in return, will be rewarded by highly competitive salaries and a dynamic working environment. Ref L/32/F

Senior Systems Designers

N. Home Counties : Salaries to £13K

A number of **Senior Systems Designers** are urgently required for the Advanced Systems Division of a well-established minicomputer manufacturer. At least one degree in a computer-related discipline followed by five years' direct involvement with systems software development, preferably gained with a leading software house, is essential. A major area of responsibility will be to provide design consultancy services across a wide number of projects and ensure that performance, functional and quality criteria are achieved. Therefore, good communications skills and high creative ability are very important, as is a software background encompassing compiler development, communications systems and block-structured languages. Ref: L/32/G

C + UNIX Designers

Greater London : Salaries to £11K

An internationally recognised supplier of Hardware and Software Systems plans to introduce a new product line based around the 'C' programming language and running under UNIX. Suitable respondents should hold a numerate degree and be fluent in an Assembler language and at least one high level language, preferably C or Pascal. Of additional interest will be those who have current involvement in a systems development role on any leading 8- or 16-bit microprocessor. Ref: L/32/H

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(0616)

SENIOR SYSTEMS ANALYSTS

£10,000–£12,000

+ excellent fringe benefits

GUILDFORD

Two Systems Analysts are required to contribute to the planning and development of our current and future Life Assurance computer systems. Applicants must be educated to at least 'A' level standard, have a background of COBOL programming, and a minimum of two years' experience of systems analysis. They must have been project leader in at least one substantial computer project controlling its design, development and successful implementation.

Qualities of enthusiasm and drive are essential together with good communication skills, high professional standards and the confidence to lead and motivate a project team.

Starting salaries are in the range of £10,000–£12,000 and first class benefits include attractive mortgage facilities, season ticket loan scheme, subsidised lunches and of course, excellent life assurance and pensions cover. Where necessary, assistance with relocation expenses will be given. Our offices are within easy reach of Guildford town centre, and we operate flexible working hours.

Please write or telephone for an application form to Eileen Wood, Personnel Manager, The Imperial Life Assurance Company of Canada, Imperial Life House, London Road, Guildford, Surrey, GU1 1TA (Tel: 571255).

IMPERIAL LIFE Imperial Life is a member of the Laurentian Group of Companies

COMPUTER PROGRAMMER

We are looking for an experienced programmer to join a small team involved in the use of a dual ICL 2976 mainframe computer and supporting minicomputers to maintain and develop systems which include:

- Accountancy
- Information Retrieval
- Planned Maintenance
- Resources Management
- Stores Data-Processing

The task will involve responsibility for analysing users' requirements and providing advice and guidance for assisting in the formulation of computer services policy, and for training programming staff.

Winfrith is a major R & D laboratory of the United Kingdom Atomic Energy Authority with considerable experience in the usage and development of complex computer codes for its scientific and engineering programme. The post advertised is to strengthen the non-scientific applications work at Winfrith and applicants should therefore have at least 2 years' direct experience of applying computer systems to commercial and technical work and to have a good background knowledge of ICL COBOL.

Starting pay will be in a range up to £8,500 p.a., depending on age and experience. Good promotion opportunities exist for Advancement to the next grade. The Authority also provides an attractive package of benefits, including an excellent contributory pension scheme.

Applications to:

United Kingdom Atomic Energy Authority
Personnel Department
AEE Winfrith, Dorchester, Dorset
Quoting Reference No: WB357
Closing date for applications — 10 September, 1982

(0612)

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£8216 TO £10296, OXFORD-BASED

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Our small Basic Systems Group plays a key role in maintaining these qualities. Developments planned for our product range have now created two new openings in the team.

Systems Engineer

Your job will be to design, test and document the new hardware developments and related software which will keep our products ahead of the field. You will, therefore, become involved at every stage from project planning and specification through to their handover to production, liaising with internal departments and external contractors as appropriate.

The successful candidate will probably have a degree and about two years experience in the industry on proven products, including microprocessors, I/O design, and low level software design. A knowledge of Z80 microprocessors, analogue hardware, and/or high level languages would be a distinct advantage.

Systems Programmer

Your job is to produce high quality software. You will concentrate on extending and enhancing the range of systems software and firmware for our microcomputer systems. Your two main areas of activity will be the machine resident software which provides a uniform interface to the hardware on our systems and software for intelligent peripheral controllers.

Essential qualifications for this vacancy include a degree, about two years experience in the development of successful low level systems software, and a thorough knowledge of high level and assembly languages and microprocessors. Specific experience in operating systems, BCPL, PLM or similar and the Z80 microprocessor would be particularly valuable.

We offer a particularly attractive range of benefits, including good salary; 25 days paid holiday; free BUPA, life and disability insurance; pension scheme and help with relocation expenses.

If you are interested in these vacancies, please contact Pat Kember by 'phone or letter for an application form, quoting CW8

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Programmer

Required to undertake post-design responsibility for the company's firmware and diagnostic programs.

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* Formation and implementation of operational procedures for the controlled release and update of programs.
* Maintenance of firmware and diagnostic programs.
* Advising on improvements in support methods and associated programs.

Engineer

Required to strengthen the existing group undertaking post-design responsibility for the hardware of the company products.

Duties will include:

* Identification and rectification of design faults.
* Liaison with internal departments on hardware support methods.
* Evaluation of new peripheral units.
* Liaison with vendor companies.

Ideally, applicants should have at least 3 years' experience in the computer industry or a related field with a relevant degree or HNC qualification.

These are senior positions within a small team, providing excellent career prospects, with an attractive remuneration package. Relocation assistance will be provided where appropriate.

Please write with full C.V. to Rob Wilson, Personnel Officer,

Rediffusion Computers Limited,
Kelvin Way, Crawley, West Sussex RH10 2LY.
Telephone Crawley (0293) 31211 ext. 278.

REDIFFUSION Computers

(0582)

NEW ZEALAND

- **Systems Analysts**
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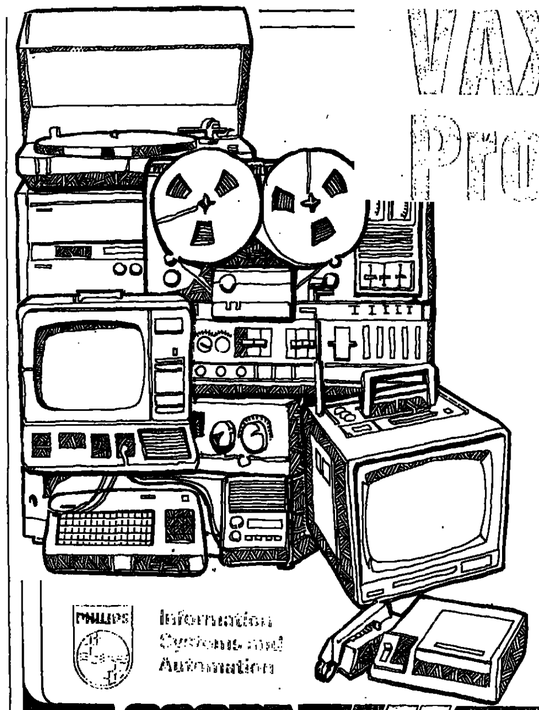

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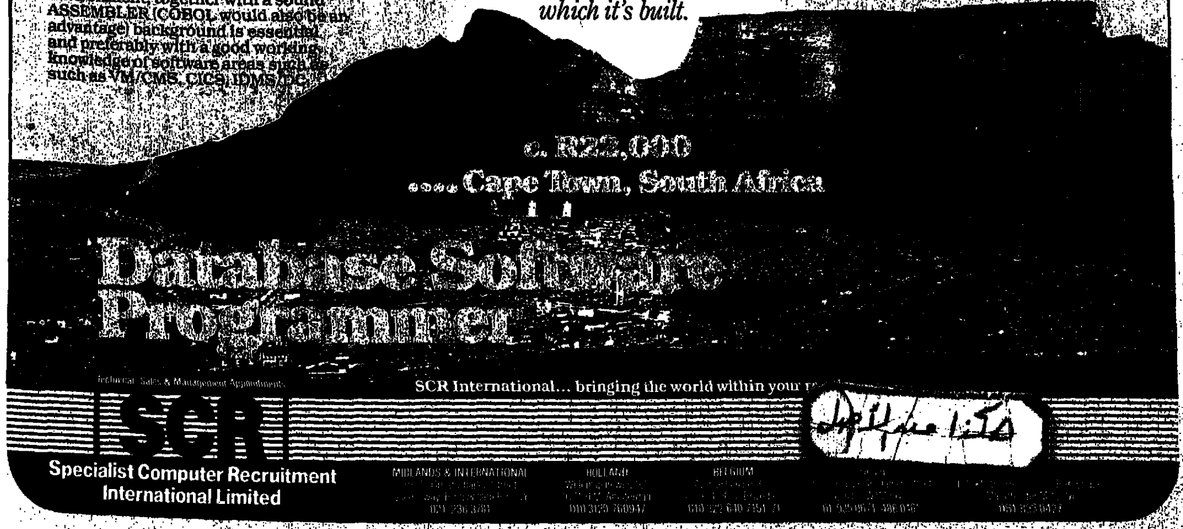

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Minimum 8 years' of Analysis and Programming experience in either Finance/Administration or Engineering applications ideally obtained in IBM DOS Cobol environment and must have Project Management experience. Experience in Interactive System Development tools or structured Analysis and Design Methodologies would be an advantage.

SENIOR ANALYST/PROGRAMMERS

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Application forms and further details are obtainable from the Director of Planning and Transportation, Staffing Section, Trent Bridge House, Fox Road, West Bridgford, Nottingham NG2 6BJ, or telephone Nottingham (0602) 824824 ext. 366. Closing date 2 September 1982.

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National Conditions of Service: Pay award pending: Salaries negotiable.
The Computer ICL 2976: VME/B operating system.
Application forms for the above posts, to be returned by 1 September, 1982, obtained from County Treasurer, Mid Glamorgan County Council, Cardiff CF1 1NJ (Cardiff 28033, ext. 520).
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(0626)

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(0624)

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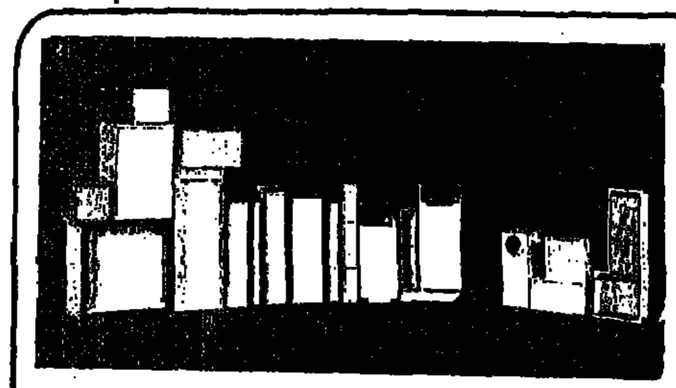

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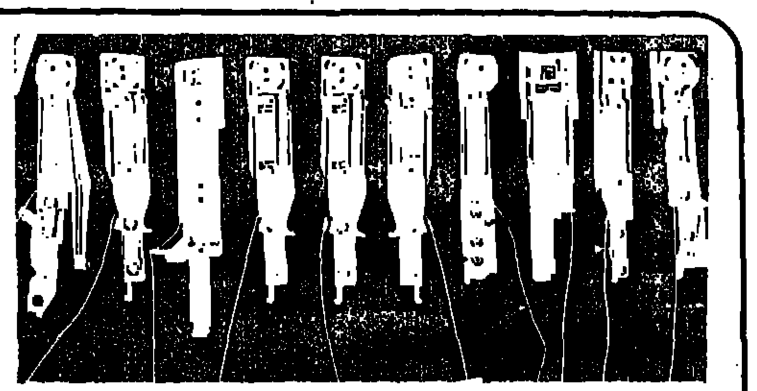

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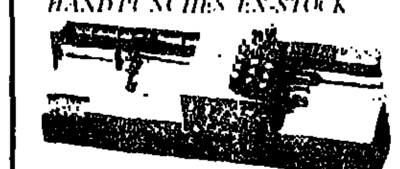

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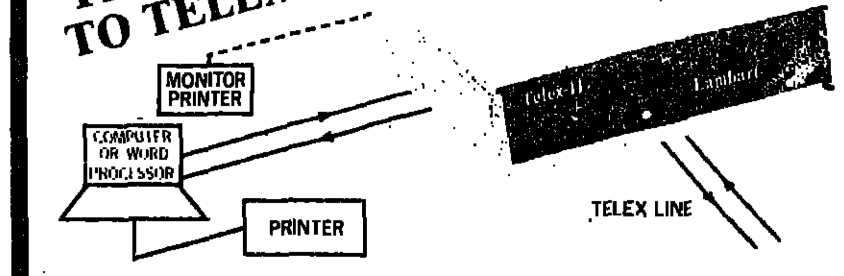

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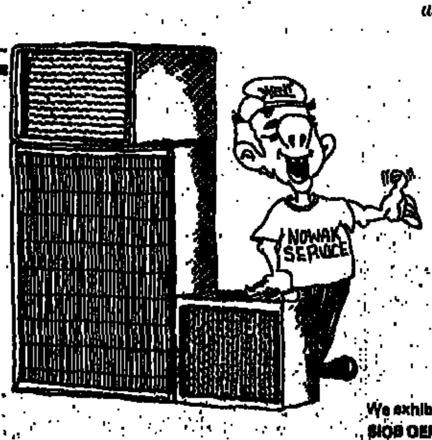

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